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Orchidaceae acostanae: typification of Costa Rican orchid species described by Rudolf Schlechter from collections by Guillermo Acosta

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ABSTRACT

Rudolf Schlechter (1872–1925) described several orchid taxa based on specimens collected in Costa Rica during the first half of the 20th century. Unfortunately, the type material kept at the Botanical Museum of Berlin-Dahlem (B) was destroyed in the bombing of Berlin, Germany, in 1943. To complete the typification of names proposed by Schlechter, based on orchid collections attributed to Guillermo Acosta in Costa Rica, we have compiled a list of 22 names. Previously, 11 lectotypifications and five neotypifications were proposed on this material. However, we found six names that lacked typification. Therefore, formal typifications are proposed for *Acostaea pleurothalloides*, *Dichaea similis*, *Goodyera micrantha*, *Lepanthes acostae*, *L. pubilabia*, and *Stelis acostae*. Additionally, we provide a biographical context to understand Acosta's relationship with Schlechter and the historical background of these collections. Finally, we provide bibliographical references and illustrations for lectotypes and neotypes. This work is part of a series focused on the nomenclature and typification of orchid names proposed by Schlechter in Costa Rica, aimed at clarifying our understanding of his species concepts in the Neotropics. Further, the typification of the names based on the collections made by the brothers Alfred and Curt Brade is necessary to complete this series.

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Introduction

Rudolf (Friedrich Richard) Schlechter (1872–1925) described 390 orchid taxa based on specimens collected in Costa Rica during the first half of the 20th century (Schlechter 1906, 1907, 1910, 1911, 1912, 1918, 1919, 1921, 1923). The specimens were collected in the field mainly by Guillermo Acosta, the brothers Kurt and Alfred Brade, Alberto Manuel Brenes, Otón Jiménez, Henry Pittier, Adolphe Tonduz, and Carlos Wercklé. Some specimens were also prepared from cultivated plants in the garden of Amparo López-Calleja in San José, Costa Rica. Unfortunately, these materials, which were kept at the Botanical Museum of Berlin-Dahlem (B), along with Schlechter's analytical drawings and notes, were destroyed in 1943 during the Second World War (Ames 1944; Hiepko 1987).

Ongoing systematic projects aimed at the publication of the treatment of Orchidaceae for the *Flora Costaricensis* (Atwood and Mora-Retana 1999; Bogarín and Pupulin 2010; Pupulin 2010a; Pupulin et al. 2020) require the clarification of concepts proposed by early botanists who studied the orchid flora of Costa Rica. Among these botanists are the Germans, Heinrich Gustav Reichenbach (1857, 1866), Fritz Kränzlin (1922, 1925), and Rudolf Schlechter (1918, 1921, 1923). In this regard,

Barringer (1986), Pupulin (2010b), and Pupulin et al. (2011, 2012, 2013, 2016, 2022) have proposed lectotypifications based on the materials obtained from some of the foremost collectors who sent material to German botanists during the late 19th and first decades of the 20th centuries. Also, these studies emphasized the historical context needed to understand the typification processes. This paper specifically focuses on the material received by R. Schlechter in two shipments from Guillermo Acosta and obtained in Costa Rica around 1921 (Schlechter 1923).

Guillermo Ramón Marcelo Acosta Piepper (1879–1955, Figure 1) was born in San Ramón de Alajuela, Costa Rica, to José Paulino Acosta Chaves and Adelina Piepper Steffen. On his maternal side, the Piepper lineage in Costa Rica traces back to his great-grandfather August, who arrived in Central America in 1854 with a group of prominent German colonists – including the naturalists von Hoffmann, von Fratzius, and Carmiol – to give life to the commercial colonies created by Baron von Bulow in the country. The family settled in San Ramón around 1870 and accumulated a significant wealth. In contrast, we have limited information about the origins of his paternal family. His grandfather, Máximo de Acosta Araya, resided in the capital of Costa Rica, San José, where

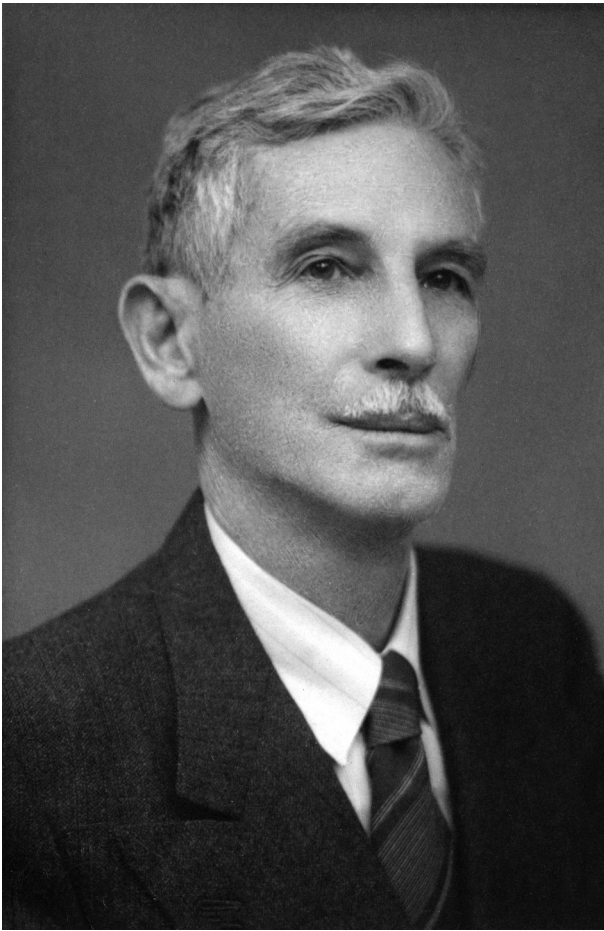


Figure 1. Guillermo Ramón Marcelo Acosta Piepper (1879–1955). Author unknown.

Guillermo's father José Paulino was baptized in 1936. The family later moved to San Ramón in the late 1960s. Guillermo had an uncle named Juan Vicente (1840–1914), who became the first Municipal President of San Ramón, Alajuela, in 1877. Juan Vicente played a significant role in the development of San Ramón by introducing various advancements, including the creation of the first public library in Costa Rica in 1879 and the establishment of the newsletter *El Ramonense* in 1901 (Quesada Alvarado 1996). He also introduced the sewer system, telegraph, public lighting, and the paving of the first streets in the town. He inaugurated the family's political vocation, which culminated with the election of Guillermo's brother, Nautilio Acosta Piepper (1883–1962), as a deputy of the republic and with the cousin Julio Acosta García's (1872–1954) presidency of the republic for the 1920–1924 period. Guillermo took an active part in the political life of his hometown, where he was a member of the directives of various institutions. He passed away on 30 July 1955.

Ossenbach (2009) highlighted the lack of information on Guillermo Acosta's botanical activities in Costa Rica. In 1923, in the fourth chapter of his *Additamenta ad Orchideologiam Costaricensem* (Additions to Costa Rican Orchidology), dedicated to

the collections of “various collectors,” Schlechter drew attention to a small unnumbered collection of orchids received in two shipments by “Don Guillermo Acosta”. In Schlechter's own words, the collection “contains not only a considerable number of new and interesting species but also two new genera”, and the German botanist further stated that “with this small but precious collection, Don Guillermo Acosta made a significant contribution to research on the orchid flora of his country of origin” (Schlechter 1923). In the hope of receiving other exciting species, Schlechter also mentioned that Acosta had promised to send more shipments to him. It remains unclear if Schlechter ever received additional specimens from Acosta as promised. However, in his later publications, Schlechter did not cite any other specimens collected by Acosta. Schlechter passed away on 16 November 1925, just two years after the publication of *Additamenta ad Orchideologiam Costaricensem* (Schlechter 1923).

What was included in the “precious collection” sent by Acosta? The two consignments contained 40 orchid specimens (Table 1). Two-thirds of them belonged to the Pleurothallidinae subtribe and comprised 19 genera. According to Schlechter's study, the collection included two new genera and 23 new species, which accounted for more than half of the total collections. This was not just a “precious collection”; it was undeniably the result of an avid collector's meticulous work! According to the labels transcribed by Schlechter (1923), all the specimens were collected in the “surroundings of San Ramón” in 1921; except for two specimens: *Masdevallia tenuicauda* Schltr. and *Ponthieva brenesii* Schltr., for which the collecting dates were not specified. Out of the 39 taxa collected by Acosta and discussed by Schlechter in his “Additamenta” (Schlechter 1923), 19 sheets are preserved in the Oakes Ames Herbarium at Harvard University. These include materials documented in various ways based on the originals that were stored at the Berlin-Dahlem Museum before its destruction. While most of these documents are tracings of Schlechter's diagnostic drawings, three also include photographs of the original herbarium sheets. These photographs were taken by J. Francis Macbride at the “Herbarium Berolinensis” during the 1930s and represent *Lepanthes lancifolia* Schltr., *Maxillaria schistostele* Schltr., and *Stelis acostae* Schltr. However, none of these sheets include labels in the collector's handwriting or any notes from the collector.

The orchid collections by Guillermo Acosta are remarkable because several of them are rare species still known only from the type collection or very few collections, such as *Dichaea acostae* Schltr., *Goodyera micrantha* Schltr., *Lepanthes acostae* Schltr., *L. lancifolia*, *L. pubilabia* Schltr., *Kefersteinia microcharis* Schltr., *Dresslerella pilosissima* (Schltr.) Luer,

and *Acianthera testifolia* (Sw.) Solano (Luer 2003b, 2003c; Pupulin 2007). Acosta prepared only one set of specimens for Schlechter, as no duplicates have been found in other herbaria in Costa Rica or elsewhere (Lobo 2003). Additionally, no other orchid specimens are attributed to Acosta in the Museo Nacional de Costa Rica (CR).

Considering his known activities, particularly his political commitment to the community of San Ramón, it is challenging to find a plausible explanation for his dedication to meticulous botanical sampling in his hometown in an isolated way in 1921. Intriguingly, he contacted Schlechter to send him a carefully selected sample of his discoveries. Moreover, it is surprising that Acosta, who had a good knowledge of San Ramón, did not to provide specific information about the provenance of his collections after the sporadic shipments of 1921. Additionally, there is no record of his further involvement in scientific orchidology for the next 30 years leading up to his death.

The National Museum of Costa Rica (MNCR), in its Heritage Department, preserves several documents that provide evidence of Guillermo Acosta's passion for orchids. At least since 1913, he grew orchids at home as evidenced in a letter from Acosta to Adolphe Tonduz dated 8 August (MNCR, Inventario 12,144). As a political leader, Acosta conducted inspections in different areas of the San Ramón canton. A letter preserved in the MNCR reveals that he had collected some orchids during these site visits (MNCR, Inventario 12,141, a letter from Acosta to Adolphe Tonduz, 17 September 1913). In another letter, dated May 1913, endorsed with the stamp of the Political Command of San Ramón and as Chief Politician, Acosta claimed to have accompanied Adolphe Tonduz on some of his botanical excursions for the National Museum. Adolphe Tonduz, who introduced scientific botany in Costa Rica and served as the first director of the National Herbarium before continuing his collection and research activities under the direction of Anastasio Alfaro, certainly had a strong friendship with Acosta. He was a frequent guest of Acosta in San Ramón on several occasions, most recently at the end of the unfortunate expedition by Count Maurice de Périgny to the northern Guatuso plains in 1913 (Pupulin et al. 2016), when Tonduz made a prolonged stay from the end of April until the middle of May. The 173 specimens gathered during his journey to San Ramón, currently hosted at the National Museum (CR) represent some of the last Costa Rican collections made by Tonduz before he departed for Guatemala in early 1921 (Pupulin et al. 2016).

We found it intriguing that, upon detailed examination, the documents reflecting Acosta's interest in orchids seem to portray him as a more novice orchid

collector than an experienced one. In many ways, these documents are inconsistent with the exceptional scientific selection of the specimens that Acosta supposedly collected in 1921 and sent to Schlechter for study. In two of the letters mentioned above that Acosta sent to Tonduz, he explicitly asks for help from the botanist of the National Museum to buy from a private collector some plants of one of the horticulturally most coveted orchids of Costa Rican flora, *Cattleya dowiana* Batem. However, in both letters, Acosta mistakenly refers to this species as “*Cattleya doveana*” giving the impression that he might not have seen the correct scientific name of this magnificent orchid and seems to be unaware of its eponymic origin. Even the letter in which Acosta claims to have participated in some of Tonduz's botanical excursions should be interpreted in its proper context. It is unclear to whom Acosta was addressing and why he felt compelled to advocate for Tonduz's labor cause. As Political Chief of San Ramón, Acosta's endorsement likely carried more weight almost akin to an official declaration, with formal validity. Such a statement was probably a direct response to a request for clarification about the official's behavior, possibly viewed as questionable regarding his duties. On 1 May 1913, the date of the letter, Tonduz had extended his stay in San José and had not returned to his place of work at the National Museum after the expedition of Count de Périgny was completed. According to a late memory of Tonduz prepared by his friend Otón Jiménez (1971), that the director of the Museum, Anastasio Alfaro, was at the point of sanctioning Tonduz for his failure to return to his duties and asked Jiménez to bring him back to the Museum. Read with this in mind; the document is by no means the pleasant chronicle of a typical outing between friends, but rather a letter of support to justify the behavior of a public official who, was often induced by his addictive vices not to fulfill his work obligations. For this reason, he mentions that Tonduz continued to collect (although it is unclear how he knew this) and reinforces it by claiming that he accompanied Tonduz on some of his botanical expeditions.

Another document provides interesting insights into what Acosta's botanist friends thought of him. Otón Jiménez (1913) recalls that the name that Tonduz first suggested for the fern species later described as *Cyathea gemmifera* Christ [= *Alsophila firma* (Bak.) D.S.Conant.], was “*C. acostai*” [sic], “dedicated to the worthy and enlightened Political Chief of that town Mr. Guillermo Acosta”, where no mention is made to his supposed interest in botany.

The National Museum of Costa Rica houses three non-orchidaceous plants collected by G. Acosta, all unnumbered and coming from San Ramón. These specimens include *Burmeistera vulgaris* E.Wimm. (Campanulaceae), *Psychotria elata* (Sw.) Hammel,

and *Rondeletia* sp. (both, Rubiaceae). All of these specimens were collected on 13 May 1913, during Tonduz's stay in San Ramón. The labels on these specimens were written in French ("*Bois de Piedades et Zapotal, près San Ramón*"), which was Tonduz's native language and the language he used to record the field data of his own collections. The coincidence of these details is noteworthy.

In our opinion, there is an excessive discrepancy between the small group of specimens that Rudolf Schlechter received from Acosta and selected with botanical accuracy and what can be considered, on a factual basis, the proper botanical training of the alleged collector. It seems that Acosta deliberately ignored the larger and more typical plants of *Epidendrum* and *Maxillaria* species that still abound around San Ramón to instead focus on the smaller and ostensibly less significant epiphytes, mainly in the hyper-diverse group of Pleurothallidinae. It seems incongruous that Acosta was selective enough to choose only three dozen tiny miniature specimens but negligent enough not to take notes on either the places he had collected them or the dates of his fieldwork. And finally, it must be acknowledged that he had an extraordinarily trained eye for rare plants. Acosta not only included among the 40 specimens that he sent to Schlechter the types of two new orchid genera and 22 species new to science, but he did it with very small taxa such as *Acostaea* Schltr. (= *Specklinia* Lindl.) and *Lepanthes* Sw., and with truly tiny flowers such as those of *Cryptophoranthus pectinatus* Schltr. [= *Acianthera testifolia* (Sw.) Solano] and *Pleurothallis pilosissima* Schltr. (= *Dresslerella* Luer). This seems an unlikely scenario to be accepted without skepticism. We propose that it is far more likely that the plants sent by Acosta to Germany had been collected by someone else, who must have been a well-trained botanist and collector according to the quality and rarity of the collected material. This "someone" is likely to have been Adolphe Tonduz.

The details of how Acosta and Schlechter first came into contact remain unknown. It might have been through Alberto M. Brenes, a fellow botanist also from San Ramón, or through Acosta's German family connections (his mother was a German citizen, and Acosta himself married another German, Herminia Beer). Nevertheless, the major liaison between Schlechter and those who collected in Costa Rica during the first years of the last century was undoubtedly Adolphe Tonduz. Tonduz corresponded directly with Schlechter at the Berlin-Dahlem Museum, both in his personal capacity and in his role as Director of the herbarium at the National Museum.

Indeed, the lengthy delay between Tonduz's last stay in San Ramón in 1913 and the date Acosta sent the materials to Berlin in 1921 may be attributed to the challenging circumstances in Europe during World

War I. Nevertheless, there might be an alternative hypothesis to explain why the orchid collections Tonduz left in San Ramón were sent for determination so late. The years that followed Maurice de Périgny's 1913 expedition to explore the plains of Guatuso, where Tonduz participated as a botanist of the National Museum, were among the darkest of his life.

It is unknown whether Adolphe Tonduz collected any specimen between 1915 and 1919. During his last 9 years in Costa Rica, he gathered only a dozen specimens, and after January 1914, he did not collect any more orchids in Costa Rica except for a specimen of *Lycaste* cf. *brevispatha* (Klotzsch) Lindl. & Paxton that he prepared from a cultivated plant grown near his home in San Francisco de Guadalupe. His last Costa Rican collection, a specimen *Epiphyllum thomsonianum* var. *costaricense* (F.A.C. Weber) Kimnach (Cactaceae) (Tonduz 18,051), is dated November 1920, and it was his only collection that year (Pupulin et al. 2016). In the late 1920s, Tonduz received a job offer to lead the Section of Phytopathology of the Agriculture Service in Guatemala. He relocated there in early 1921 but passed away that same year from alcoholic enterocolitis. It is unlikely he intended to return to Costa Rica. It is possible that in his final lucid moments, he wanted to conclude his chapter on Costa Rican botany by requesting his friend Acosta to send the latest orchid collections he had prepared almost a decade earlier to Dr. Schlechter. While this remains a hypothesis, it seems a more logical and plausible explanation for the small yet remarkable collection of skillfully collected orchids around San Ramón, the focus of this article.

Hence, to clarify Schlechter's concepts, we evaluated a compilation of 22 names proposed by him that were based on 40 orchid specimens (ostensibly) collected in Costa Rica by Guillermo Acosta (Schlechter 1923). For this evaluation, we extensively reviewed Rudolf Schlechter's publications (Schlechter 1906, 1907, 1910, 1911, 1912, 1918, 1919, 1921, 1923), and subsequent typification studies related to the destroyed Schlechter specimens at B (Barringer 1986; Pupulin 2010b; Pupulin et al. 2011, 2012, 2013, 2016, 2022). Furthermore, we consulted the most recent taxonomic treatment of Orchidaceae for Mesoamerica (Ulloa Ulloa et al. 2023) and taxonomic reviews of *Dichaea* (Pupulin 2001), along with the subtribes Maxillarinae, Oncidiinae, and Zygopetalinae (Atwood and Mora-Retana 1999; Pupulin 2010a). In addition to these literature sources, we conducted exhaustive searches in online databases, such as JSTOR Plants (<https://plants.jstor.org>) and TROPICOS (<https://www.tropicos.org>). To further complement the information provided in the protologues and to search for specimens available for typification, we visited the AMES and CR herbaria. Furthermore, we requested information from B, BM, G, US, K, and W. In addition to previous lectotypifications for *Acostaea*

costaricensis, *Dichaea acostae*, *Epidendrum trianthum*, *Hexadesmia acostae*, *Kefersteinia microcharis*, *K. subquadrata*, *Maxillaria schistostele*, *Pleurothallis acostae*, *Pleurothallis excavata*, *P. pilosissima*, and *Ramonia pulchella*, and five neotypifications for *Cryptophoranthus pectinatus*, *Lepanthes lancifolia* Schltr., *Maxillaria acostae*, *Restrepia angustilabia*, and *R. subserrata* (Luer 1996; Atwood and Mora-Retana 1999), this study proposes typifications for the remaining six names: *Acostaea pleurothalloides*, *Dichaea similis*, *Goodyera micrantha*, *Lepanthes acostae*, *L. pubilabia*, and *Stelis acostae*. The only available material for these remaining species consists of tracings or photographs from Schlechter's drawings or specimens of the holotype. These tracings were prepared by Dr. Mansfeld under Schlechter's supervision and sent to AMES in 1934, along with photographs of a few holotypes taken in Berlin before their destruction (Barringer 1986). Unfortunately, no type material or drawings of the type of *Restrepia angustilabia* and *R. subserrata* exist (Luer 1996). Among Acosta's collections, only two specimens have been preserved, the fragments of the holotypes of *Dichaea acostae* and *D. similis* at AMES (Pupulin 2007).

Typification of Costa Rican Orchidaceae described from collections by G. Acosta

1. *Acostaea costaricensis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 284. 1923.

= *Specklinia mirifica* Pridgeon & W.M. Chase, Lindleyana 16: 258. 2001.

Syntypes: – COSTA RICA. [Alajuela]: Umgebung von San Ramón, im Jahre 1921, *G. Acosta s.n.*, B, destroyed. [San José: Moravia]: San Jerónimo, im Mai 1921, *C. Wercklé 17*, B, destroyed (Lectotype: designated by Pupulin (2010b): tracings of Schlechter's drawings of a syntype, AMES–29708, barcode 00000068 drawings at top left and bottom right) (Figure 2A–B).

Notes: – In the protologue, Schlechter (1923) cited two other collections: *C. Wercklé 73*, flowered in September 1921, and *Brade 1119*, both collected at La Palma. However, no isotypes of the collections cited by Schlechter in the protologue are currently known to exist (Pupulin 2010b). Therefore, it is likely that the analytical drawings were based on the two syntypes (AMES 29,708). However, since the drawings do not indicate the collector, they cannot be definitively assigned to either Acosta or Wercklé. The top right sketch (AMES 29,708) appears to depict a sterile plant, while the top left sketch depicted a fertile plant (Figure 2A). According to Pupulin (2010b), the bottom right drawing (Figure 2B) more closely matches the characters described by Schlechter (1923), particularly the bifid synsepal, with shortly acuminate apices and the sinuate margin of the column wings. As a result, this drawing and the drawing of the fertile plant were

selected as the lectotype by Pupulin (2010b). Luer (1987) treated *A. costaricensis* as ssp. *costaricensis*, to distinguish it from populations in eastern Panama and Colombia. Pridgeon and Chase (2001) treated this species under *Specklinia* Lindl., with the new name *Specklinia mirifica* Pridgeon & M.W.Chase.

The TROPICOS database (<https://www.tropicos.org>) considered this lectotypification as a neotypification stating that “drawings are not considered original material”. However, according to the Article 9.3 of the Shenzhen code (Turland et al. 2018) “a lectotype is one specimen **or illustration** designated from the **original material**”. Also, the Art. 9.4 defines original material as the material that “comprises the following elements: (a) those specimens **and illustrations** (both unpublished and published before publication of the protologue) that the author associated with the taxon, and that were available to the author before, or at the time of, preparation of the description, diagnosis, or illustration with analysis (Art. 38.7 and 38.8) validating the name . . .”. Furthermore, Art. 9.12 states that “In lectotype designation . . . if no isotype, syntype or isosyntype is extant . . . the lectotype must be chosen from among the uncited specimens and cited and **uncited illustrations** that comprise the remaining **original material**”. In addition, Art. 6.1 footnote states, “Here and elsewhere in this Code, the term ‘illustration’ designates a work of art or a photograph depicting a feature or features of an organism, e.g. a drawing, a picture of a herbarium specimen, or a scanning electron micrograph”. Therefore, a drawing or a photograph that fulfills these criteria can be considered as original material and, subsequently, selected as a lectotype.

2. *Acostaea pleurothalloides* Schltr., Repert. Sp. Nov. Regni Veg. Beih. 19: 285. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramón, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed (Lectotype: tracings of Schlechter's drawings of the holotype, AMES–31277, barcode 00000069, designated here). (Figure 2C–D).

= *Acostaea costaricensis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 284. 1923.

Notes: – The sheet at AMES (31277, barcode 00000069) has two drawings made under the supervision of R. Schlechter (Figure 2C–D). The sheet also has a specimen collected in Navarro, Cartago, by C. H. Lankester (s.n.) in 1948. Given the absence of known isotypes or paratypes, the tracings of Schlechter's drawings of the plant and dissection of the flower are chosen as the lectotype. The details shown in the drawing are consistent with the protologue. Luer (2003a) considered this species a synonym of *Acostaea costaricensis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 284. 1923.

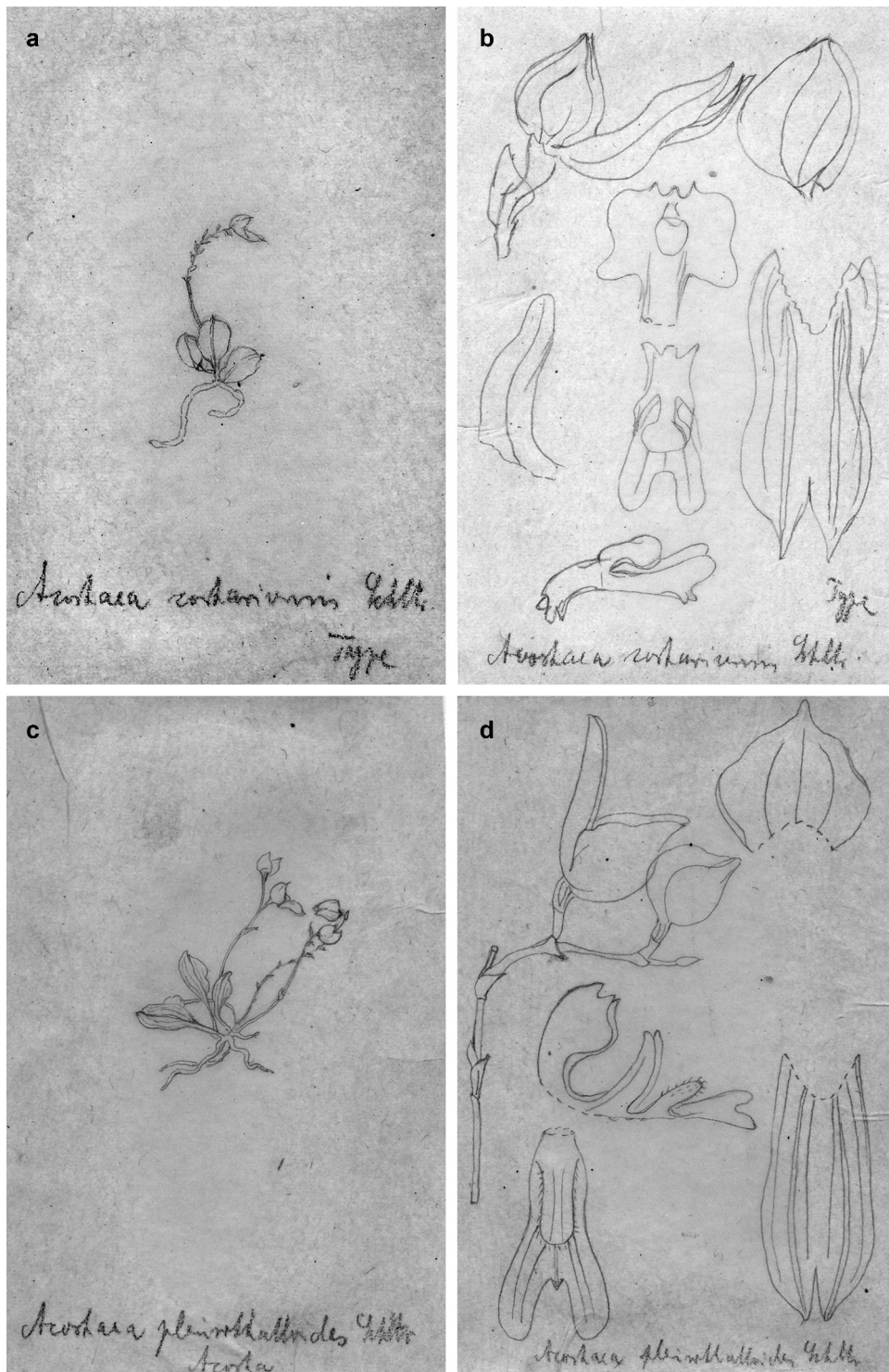


Figure 2. A. *Acostaea costaricensis* Schltr. Tracing of Schlechter's drawing of the plant habit from a syntype (AMES 29,708), b. *Acostaea costaricensis* Schltr. Tracing of Schlechter's analysis of the flower from a syntype (AMES 29,708), c. *Acostaea pleurothalloides* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,277), d. *Acostaea pleurothalloides* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,277). All images are reproduced with the kind permission of the Harvard University Herbaria.

3. *Cryptophoranthus pectinatus* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 277. 1923. **Type:** – COSTA RICA. [Alajuela]: Umgebung von San Ramón, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by Solano (2015) (as neotype); tracings of Schlechter's

drawings of the holotype, AMES–31559, barcode 00098493). (Figure 3A–B).

≡ *Acianthera testifolia* (Sw.) Solano, Acta Bot. Mex. 97: 50. 2011.

≡ *Epidendrum testifolium* Sw., Prodr. Veg. Ind. Occ.: 122. 1788.

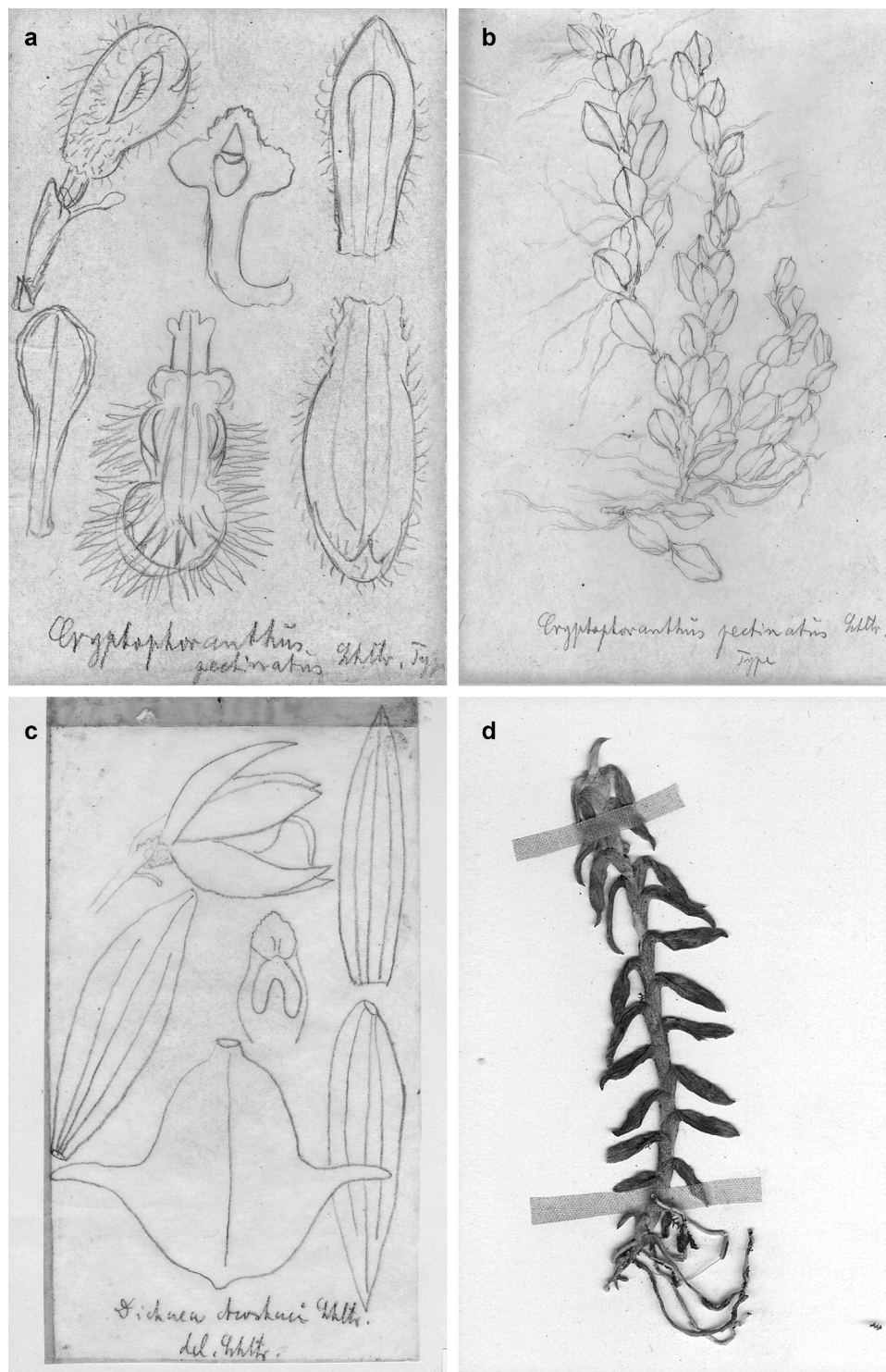


Figure 3. A. *Cryptophoranthus pectinatus* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,559), B. *Cryptophoranthus pectinatus* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,559), C. *Dichaea acostae* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 40,542), D. *Dichaea acostae* Schltr. Fragment of a stem from the holotype (AMES 40,542). All images are reproduced with the kind permission of the Harvard University Herbaria.

≡ *Cymbidium testifolium* (Sw.) Sw., Nova Acta Regiae Soc. Sci. Upsal. 6: 71. 1799.

≡ *Pleurothallis testifolia* (Sw.) Lindl., Ann. Mag. Nat. Hist., III, 1: 328. 1858.

≡ *Humboltia testifolia* (Sw.) Kuntze, Revis. Gen. Pl. 2: 668. 1891.

≡ *Apoda-prorepentia testifolia* (Sw.) Luer, Monogr. Syst. Bot. Missouri Bot. Gard. 95: 255. 2004.

Notes: – The tracings of Schlechter's drawings of the holotype kept at AMES represent the only original material found for this species. No isotypes or any other material annotated by Schlechter exist for this species. The drawing on top of the sheet (Figure 3B) shows a creeping plant, and the drawing below (Figure 3A) shows the analytical drawing of the flower. Schlechter (1923) described the plant as an epiphyte, repent, flexuous with obovate, thick leaves, as represented in the top sketch. The flower analysis shows a characteristic pandurate lamina of the lip with pectinate-lacerate margins and scattered short, soft spines on the blade, consistent with the protologue and the differences noted by Schlechter (1923).

4. *Dichaea acostae* Schltr., Repert. Sp. Nov. Regni Veg. Beih. 19: 306. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramón, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed (Lectotype: designated by Pupulin (2007): tracings of Schlechter's drawings of the holotype, AMES-40542, barcode 00061190). (Figure 3C–D).

Notes: – Pupulin (2007) selected a fragment of the type (isotype) at AMES as the lectotype. The sheet also bears the diagnostic sketches prepared by R. Schlechter and copied by Dr. Mansfeld. The species is rather distinctive among *Dichaea*. Schlechter compared the species with *D. costaricensis* Schltr., but noted slight differences in the narrower leaves and the longer, horizontally projecting tips of the lateral lobes of the lip. Schlechter (1923) stated that the entire lip resembles that of *D. vaginata* Rchb.f. ex Kraenzl. (a synonym of *D. cryptarrhena* Rchb.f. ex Kraenzl.), while the entire plant bears more resemblance to *D. squarrosa* Lindl. According to Pupulin (2007), the flowers are among the smallest of Costa Rican *Dichaeas*. Unfortunately, this species has not been collected again since 1921 (Pupulin 2007).

5. *Dichaea similis* Schltr., Repert. Sp. Nov. Regni Veg. Beih. 19: 307. [November] 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramón, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed (Lectotype: AMES-40552, barcode 00064843 (a fragment of stem); tracing of Schlechter's drawings of the type, made under the supervision by Schlechter, AMES-40552, barcode 00064843], designated here) (Figure 4A–B).

= *Dichaea schlechteri* Folsom, Orch. Digest 58: 189–190. 1994.

Notes: – A fragment of the stem (duplicate) from the type specimen from B and kept at AMES has been selected here as the lectotype (Figure 4B). The sheet also includes a drawing analysis of the flower made under the supervision of Schlechter (Figure 4A). Schlechter (1923) compared this species with *D. obovatipetala* Schltr., and distinguished them based

on the smaller flower size in *D. similis*. *Dichaea obovatipetala* has broader petals and an entirely different labellum, which is densely ciliated with short projections. Folsom (1987) treated this species under *D. cryptarrhena*. However, Pupulin (2007) proposed adopting *D. similis* for some *Dichaea* specimens that do not fit within the strict concept of *D. cryptarrhena*. Under this circumscription, Pupulin (2007) treated *D. schlechteri* Folsom as a synonym of *D. similis*. For a more detailed discussion of the diagnostic features of *D. similis*, refer to Pupulin (2007).

6. *Epidendrum trianthum* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 296. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed (Lectotype: designated by Santiago and Hagsater (2008): tracings of Schlechter's drawings of the plant and flower from the holotype, AMES-31638, barcode 00070908). (Figure 4C–D).

= *Epidendrum nagelii* L.O. Williams, Amer. Orch. Soc. Bull. 10: 103. 1941.

Notes: – In the absence of any type material available, Santiago and Hagsater (2008) selected the Schlechter's drawings of the plant and flower from the holotype as the lectotype. The plant is depicted as having one stem with oblong-ovate wide leaves (4.7–7.0 × 2.5–3.5 cm) and three flowers emerging from a conduplicate spathaceous bract (Figure 4D). The flower dissection shows the shape of the lip unguiculated, bicallose, cordate at base, and constricted in the middle (Figure 4C). In addition, the margin is slightly erose. These features were noted by Schlechter (1923) and are consistent with the selected lectotype.

7. *Goodyera micrantha* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 274. 1923. **Type:** – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed

(Lectotype: tracings of Schlechter's drawings of the holotype, AMES-31634, barcode 00099597, designated here) (Figure 5A–B).

Notes: – No isotypes, paratypes, or any other type material of this species exist. Therefore, the tracing of Schlechter's drawing of the holotype has been selected as the lectotype. The drawing on the right depicts the plant habit (Figure 5B), described as terrestrial, 16–20 cm tall with pilose roots. The leaves are lanceolate, acute, 3.2–4.5 × 1.4–2.3 cm, and the dense, racemose inflorescence bears 12–18 flowers. The drawing on the left shows a dissected flower (Figure 5A), with oblique petals with undulate, agglutinate margins, and an ovate, concave, acute lip, as described in the protologue.

8. *Hexadesmia acostae* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 293. 1923.

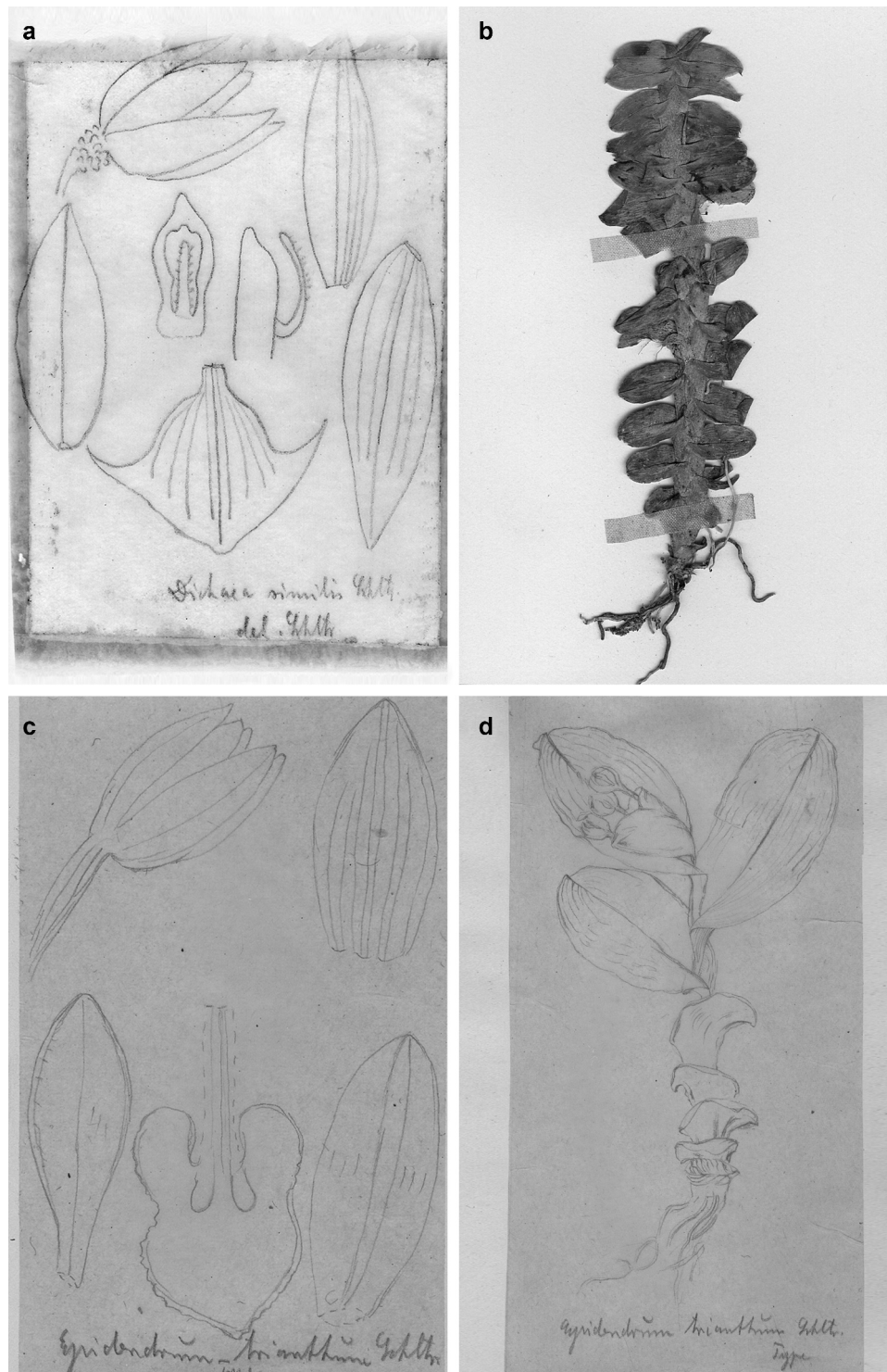


Figure 4. A. *Dichaea similis* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 40,552), b. *Dichaea similis* Schltr. Fragment of a stem from the holotype (AMES 40,552), c. *Epidendrum trianthum* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,638), d. *Epidendrum trianthum* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,638). All images are reproduced with the kind permission of the Harvard University Herbaria.

≡ *Scaphyglottis acostae* (Schltr.) C.Schweinf., Bot. Mus. Leafl. 10: 27. 1941.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by de Retana DE and Atwood (1989), tracings of Schlechter's drawings of the holotype, drawings on top left and bottom left of the sheet, AMES–26769, barcode 00100300). (Figure 5C–D).

= *Hexadesmia powellii* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 17: 27.1922.

Notes: – Mora de Retana & Atwood (de Retana DE and Atwood 1989) typified the name using the term “type” and specifying the herbarium (AMES) where the original material is preserved, following Art. 7.11. The only type material available for this species was tracings of Schlechter's drawings of the

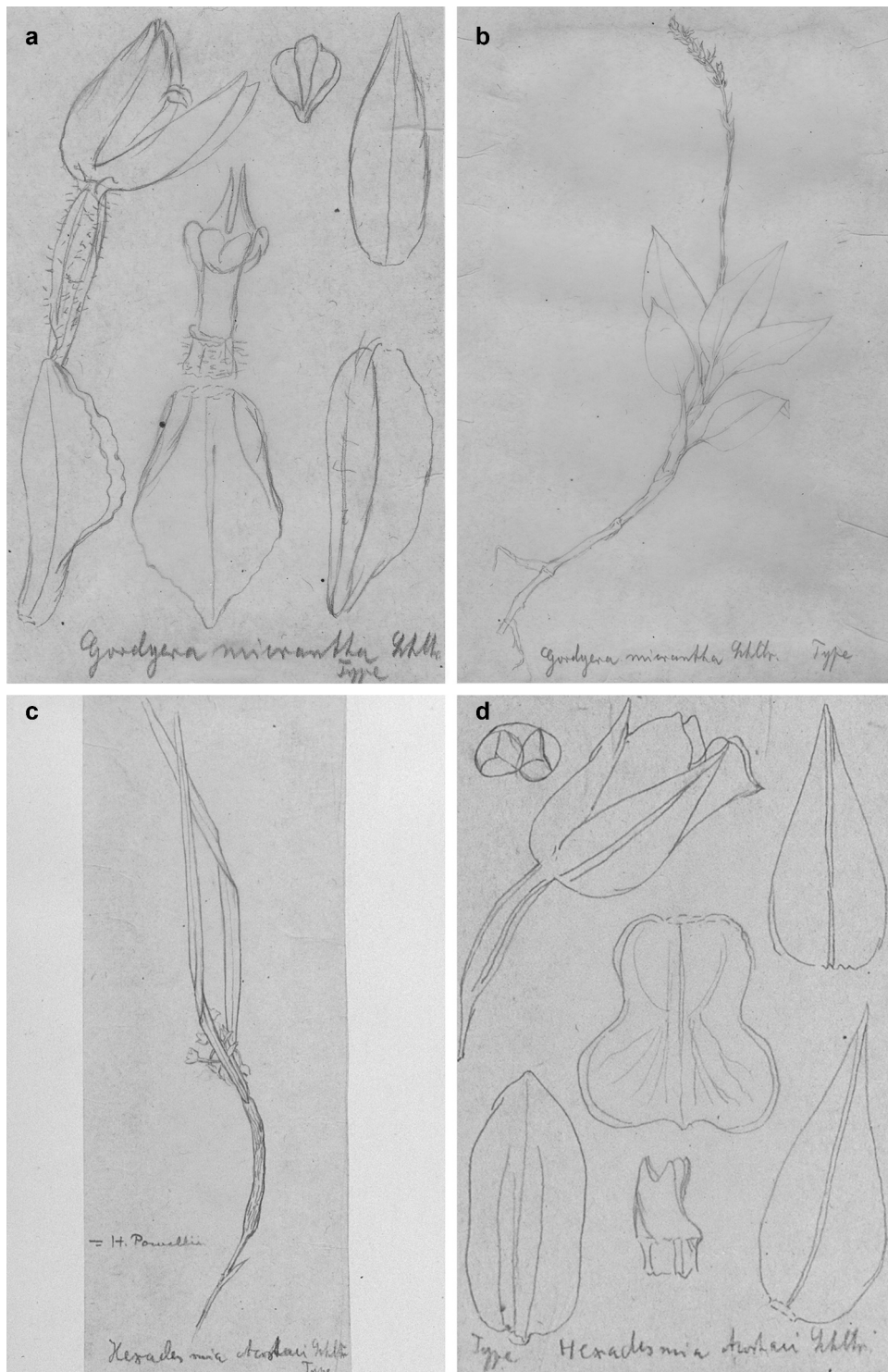


Figure 5. A. *Goodyera micrantha* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,634), b. *Goodyera micrantha* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,634), c. *Hexadesmia acostae* Schltr. Tracing of Schlechter's drawing of a stem of the plant from the holotype (AMES 26,769), d. *Hexadesmia acostae* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 26,769). All images are reproduced with the kind permission of the Harvard University Herbaria.

holotype found at AMES and shown at the top left and bottom left of the sheet. The top left drawing shows a bifoliate, fusiform pseudobulb with linear leaves ($90.00 \times 2.75\text{--}3.75$ mm) and few small flowers (Figure 5C). The drawing on the bottom left shows the dissected flower with the characteristic ovate, acute sepals and petals, and the

subpandurate, truncate lip (Figure 5D). All features fit well with the description in the protologue. The drawings selected as lectotype are mounted with a drawing on the top right corresponding to *H. powellii* based on a collection of C.W. Powell in Panama. However, the latter species is currently a synonym of *S. acostae* (Dressler et al. 2004). This

species is common in montane and premontane forest from elevations between 1200 and 2500 m in Costa Rica and Panama.

9. *Kefersteinia microcharis* Schltr., Repert. Sp. Nov. Regni Veg. Beih. 19: 300. 1923. **Type:** – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im

Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by Pupulin (2001): tracings of Schlechter's drawings of the holotype, AMES-40556). (Figure 6A).

Notes: – No isotypes or paratypes or any other type material of this species are known to exist. Thus, Pupulin (2001) designated the tracing of Schlechter's

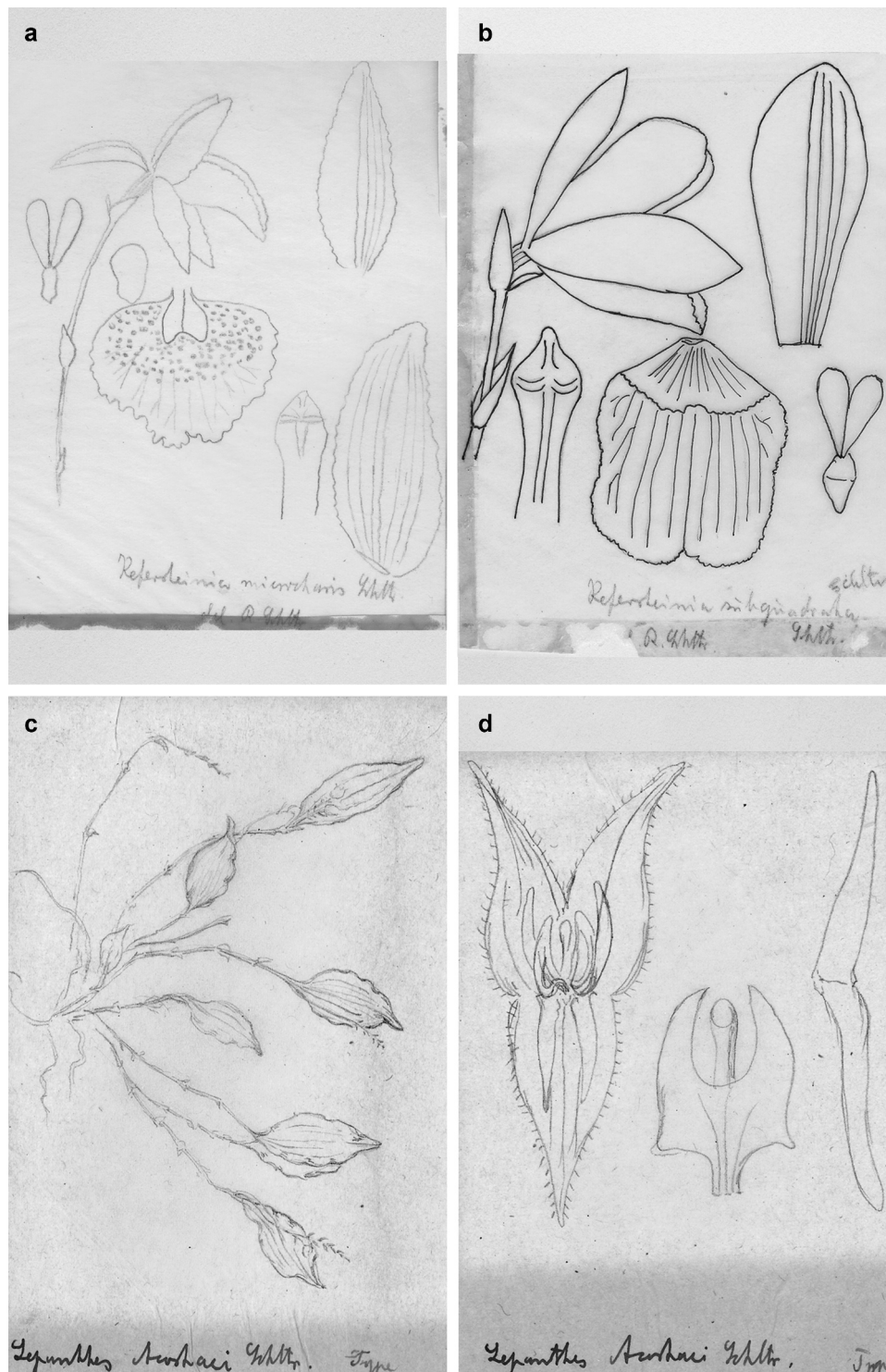


Figure 6. A. *Kefersteinia microcharis* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 40,556), b. *Kefersteinia subquadrata* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 40,057), c. *Lepanthes acostae* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,620), d. *Lepanthes acostae* Schltr. Tracing Schlechter's analysis of the flower from the holotype (AMES 31,620). All images are reproduced with the kind permission of the Harvard University Herbaria.

drawing of the holotype as the lectotype. According to Schlechter (1923), *K. microcharis* is distinguished by the subreniform, widely ovate lip with a rhombic callus and a semiterete column without lateral wings and a short abaxial keel. In a brief note accompanying the original description, Schlechter also emphasized that *K. microcharis* presents much more crenulate margins of the lip than any other Central American *Kefersteinia*. Schlechter's drawing of the holotype, housed at AMES, clearly illustrates the subreniform lip, the callus wider in the distal portion, and the oblong column lacking wings. These characteristics distinguish *K. microcharis* from the closely related species within the *K. lactea* complex.

10. *Kefersteinia subquadrata* Schltr., Repert. Sp. Nov. Regni Veg. Beih. 19: 300. 1923.

≡ *Chaubardiella subquadrata* (Schltr.) Garay, Orquideología 4: 149. 1969.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, *G. Acosta s.n.* (B, destroyed). Lectotype: designated by Pupulin (2010a); tracings of Schlechter's drawing of the holotype, AMES-40057 (Figure 6B).

= *Stenia chasmatochila* Fowlie, Orchid Digest 29: 347. 1965.

= *Chaubardiella chasmatochila* (Fowlie) Garay, Orquideología 4: 148. 1969.

Notes: – No isotypes or paratypes of this species are known to exist, so the tracings of Schlechter's drawings of the flower dissection were chosen as the lectotype by Pupulin (2010a). The drawing (Figure 6B) shows the subquadrate outline of the lip, shortly excise at apex, and the flabellate callus that agree with the protologue.

11. *Lepanthes acostae* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 280. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed (Lectotype: tracings of Schlechter's drawings of the holotype, AMES-31620, barcode 00100489, designated here). (Figure 6C–D).

Notes: – No isotypes, paratypes, or any other type material of this species were found. The tracings of Schlechter's drawings of the holotype were selected as the lectotype. The drawing on top shows the plant habit (Figure 6C), which was compared to *L. lindleyana* Rchb.f. according to Schlechter (1923). The drawing at the bottom (Figure 6D) shows a flower and front views of the lip and petal. Schlechter (1923) described the sepals as ciliate or denticulate and the petals as bilobate with elongate linear lobes. He compared the plant habit with *L. lindleyana* but the flowers with *L. ciliisepala* Schltr. From *L. lindleyana* he separated *L. acostae* by the ciliated sepals, petals, and lip. From *L. ciliisepala* he recognized the narrower leaves

and lip shape as differences between both species. Luer (2003b) considered this species as a synonym of *L. blepharistes* Rchb.f. However, given the elongated, ciliate petals of *L. acostae*, which bear a strong resemblance to those of *L. ciliisepala*, it could be argued that both species might be considered conspecific.

12. *Lepanthes lancifolia* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 281. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, 1921, *G. Acosta s.n.*, holotype, B, destroyed (Lectotype: designated by Luer (2023) in Ulloa Ulloa et al. (2023) (as neotype): photograph of the holotype and associated tracings of Schlechter's analysis of the flower of the holotype, AMES-31685, barcode 00100623). (Figure 7A–B).

Notes: – No isotypes, paratypes, or any other type material of this species exist. Luer (2023) selected the tracings of Schlechter's drawings of the holotype and photo of the holotype as the neotype but it should be regarded as a lectotype since it is part of the original material (as discussed in *Acostaea costaricensis*; see Pupulin et al. 2022). The photo of the holotype shows four separate stems with leaves (Figure 7A) and exhibits narrow lanceolate, acuminate leaves and the characteristic lepanthiform sheaths. Schlechter (1923) noted that *L. lancifolia* was morphologically similar to *L. stenophylla* Schltr. but distinguished it by the unequal blade of the petals (the upper lobe is longer and wider than the lower lobe) and the characteristic shape of the lip. These features are consistent with the drawing of the flower parts observed in the photo of the holotype and the copy of the same drawing on the sheet at AMES (Figure 7B). *Lepanthes lancifolia* is only known from the type collection, and no other plants of this species have been found after its description (Luer 2003b).

13. *Lepanthes pubilabia* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 282. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed. (Lectotype: tracings of Schlechter's drawings of the holotype, AMES-31251, barcode 00100677, designated here). (Figure 7C–D).

Notes: – No isotypes or paratypes or any other type material of this species were found. The tracings of Schlechter's drawings of the holotype were selected as the lectotype. The drawing at the top shows the plant habit (Figure 7C), and the drawing at the bottom shows a flower and its dissection (Figure 7D). The sepals are ovate, acute; the petals are bilobate, ciliate with the ovate, obtuse upper lobe, the narrower lower lobe. The lip is also ciliate at apex. Schlechter (1923) compared *L. pubilabia* with *L. brenesii* Schltr., but distinguished it by the dense papillose petals and lip. Luer (2003b) treated *L. brenesii* under *L. turialvae* Rchb.f.; however, *L. turialvae* has acute petals and

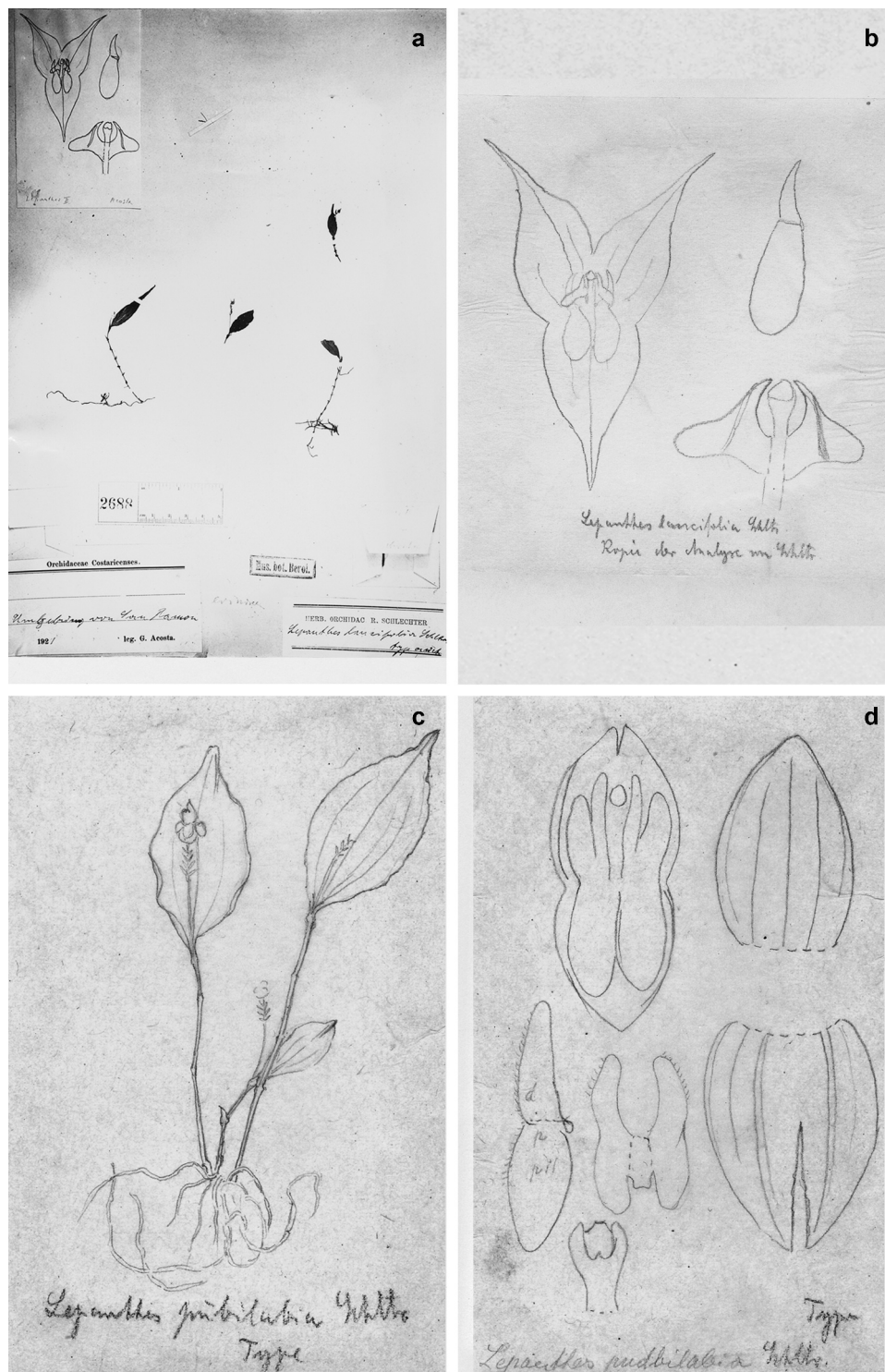


Figure 7. A. *Lepanthes lancifolia* Schltr. Photograph of the holotype and flower analysis by Schlechter (AMES 31,685), b. *Lepanthes lancifolia* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,685), c. *Lepanthes pubilabia* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,251), d. *Lepanthes pubilabia* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,251). All images are reproduced with the kind permission of the Harvard University Herbaria.

not obtuse, as shown in the drawing of the lectotype. This shape of petals and the flower morphology is consistent with species within the *L. disticha* Garay & R.E.Schult. complex.

14. *Maxillaria acostae* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 301. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by Atwood and Mora-Retana (1999) (as neotype): tracings of Schlechter's drawings of the holotype, AMES-40543, barcode 00101348) (Figure 8A).

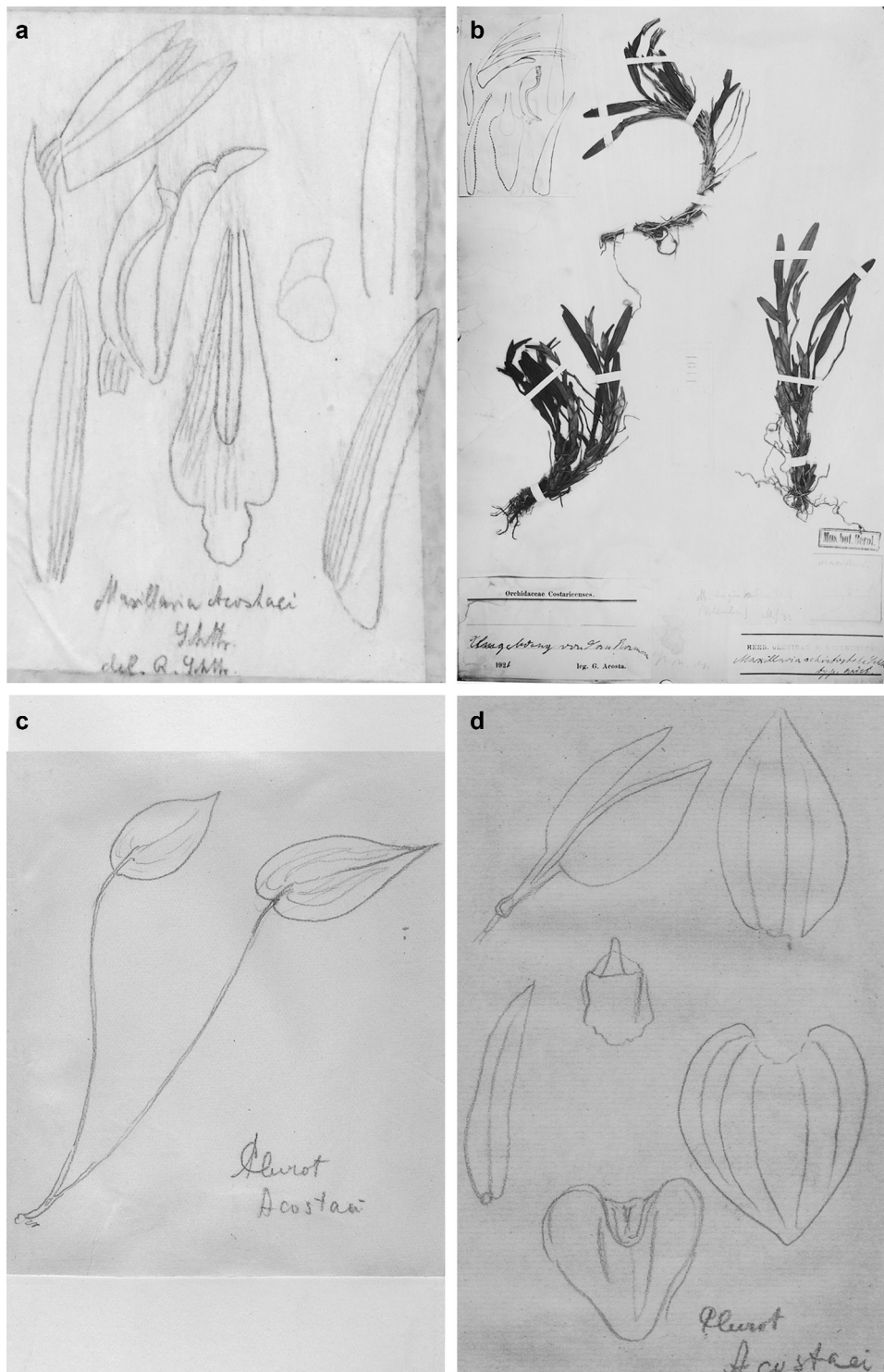


Figure 8. A. *Maxillaria acostae* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 40,543), b. *Maxillaria schistostele* Schltr. Photograph of the holotype and flower analysis by Schlechter (AMES 118,027), c. *Pleurothallis acostae* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 56,388), d. *Pleurothallis acostae* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 56,388). All images are reproduced with the kind permission of the Harvard University Herbaria.

Notes: –Atwood and Mora-Retana (1999) determined that the drawing analysis made by Dr. Mansfeld and sent to AMES in December 1934 should be designated as the neotype. The drawing depicts a flower dissection with a trilobate lip and a short column foot, but it does not show the plant habit. According to Schlechter

(1923), the species is an epiphytic, erect herb of 9–12 cm long with narrowly oblong, unifoliate pseudobulbs that are 1.2–1.5 cm long. The leaves are anguste-ligulate, acute, 7.5–9.0 × 0.7–0.9 cm. Schlechter (1923) compared the species with *M. reichenheimiana* Endrés & Rchb.f. and *M. ramonensis* Schltr., and differentiated them

from the later based on the shape of the pseudobulb and the smaller flowers with a much shorter chin

15. *Maxillaria schistostele* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 303–304. 1923.

≡ *Rhetinantha schistostele* (Schltr.) M.A. Blanco, Lankesteriana 7(3): 535. 2007.

Type: – Costa Rica. [Alajuela]: Umgehung von San Ramón, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by Atwood and Mora-Retana (1999), AMES–118027, barcode 00101504). (Figure 8B).

Notes: – Atwood and Mora-Retana (1999) designated the photo of the holotype as the lectotype, which constitutes a type designation under Art. 7.11 since they used the term “type” and specified the herbarium where the specimen is kept (AMES). The lectotype shows three plants and a drawing of a flower and its dissection on the top left. This species belongs to the Andean group of *M. acuminata* Lindl. complex or *M. acuminata* clade as defined by Whitten et al. (2007). The characteristics of this group include a rhizomatous habit, 1–2 foliate pseudobulbs, cartilaginous flowers, entire lip with rounded basal callus, and the serrate clinandrium. According to Schlechter (1923), *M. schistostele* is characterized by relatively large flowers. If a narrower circumscription of *Maxillaria* is followed, as proposed by Whitten et al. (2007), and Blanco et al. (2007), this species should be treated under *Rhetinantha*.

16. *Pleurothallis acostae* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 285. 1923. *Pleurothallis acostae* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 285. 1923, hort. var.

Type: – COSTA RICA. [Alajuela]: Umgehung von San Ramón, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by Luer (2005): tracings of Schlechter’s drawings of the holotype, AMES–56388, barcode 00074019). (Figure 8C–D).

Notes: – No isotypes or paratypes for this species exist. Luer (2005) selected the tracings of Schlechter’s drawings of the holotype as the lectotype. The drawing on the left shows the plant habit represented by two schematic stems without flowers (Figure 8C). The drawing on the right shows a closed flower and a flower dissection exhibiting the ovate, connate lateral sepals, the linear-ligulate petals, and the thick, ovate lip, which is narrower towards the apex (Figure 8D). Schlechter compared the species with *Pleurothallis leucantha* Schltr. from Guatemala. Currently, *Pleurothallis acostae* is treated under *P. phyllocardioides* Schltr (Luer 2003c).

17. *Pleurothallis excavata* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 287. 1923.

≡ *Acronia excavata* (Schltr.) Luer, Monogr. Syst. Bot. Missouri Bot. Gard. 103: 133. 2005.

≡ *Zosterophyllanthos excavatus* (Schltr.) Szlach. & Kulak, Richardiana 6(4): 189. 2006.

Type: – COSTA RICA. [Alajuela]: Umgehung von San Ramón, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by Luer (2005): tracings of Schlechter’s drawings of the holotype, AMES–31280, barcode 00074241). (Figure 9A–B).

Notes: – Luer (2005) selected the drawing analysis by Dr. Mansfeld and sent to AMES in December 1934 as the lectotype since no other type materials are known to exist for this species. This same material has been designated by Luer (2023) as neotype. The drawing on the top left depicts the plant habit with two stems (Figure 9A), while the drawing on the right shows a flower dissection (Figure 9B). According to Schlechter (1923), the plant is as an epiphytic, erect herb of 8.5–10.0 cm long with oblique-ligulate, sessile, coriaceous, leaves of 5.0–6.7 × 1.1–1.3 cm. The flowers are dark purple, with ovate, obtuse sepals, oblique-oblong petals, ca. 2 mm long, and an ovate, apiculate, excavate lip of 4 mm long.

18. *Pleurothallis pilosissima* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 289. 1923.

Type: – COSTA RICA. [Alajuela]: Umgehung von San Ramón, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by de Retana DE and Atwood (1993a), tracings of Schlechter’s drawings of the holotype, AMES–31281, barcode 00074623). (Figure 9C–D).

≡ *Restrepia pilosissima* (Schltr.) Ames & C. Schweinf., Bot. Mus. Leafl. 4(6): 100. 1937.

≡ *Restrepiella pilosissima* (Schltr.) Garay & Dunst., Venez. Orchid. Ill. 4: 266. 1966.

≡ *Dresslerella pilosissima* (Schltr.) Luer, Selbyana 2 (2–3): 185. 1978.

Notes: – Mora de Retana & Atwood (de Retana DE and Atwood 1993a) used the term “type” and specified the herbarium where the original material is kept (AMES), making it a lectotypification under Art. 7.11. No isotypes, paratypes, or any other type material exist for this species. The only available material consists of tracings of Schlechter’s drawings of the holotype. The drawing on the left depicts the characteristic pilose stem and narrowly lanceolate leaves as described in the protologue (Figure 9C). The inflorescence is erect, bearing one flower. The drawing on the right shows the densely pilose flower and a flower dissection (Figure 9D). The sepals and petals are ovate at the base with an acuminate or tentaculiform apex, consistent with the protologue (Schlechter 1923). The unguiculate lip has two sharp curved teeth, a narrow isthmus, and a wide, ovate, truncate, ciliate apex, which also matches the protologue. Although Schlechter (1923) suspected that this species belonged to a different genus than *Pleurothallis*, he decided to treat it under that genus until more material was available for study. The name is the basionym

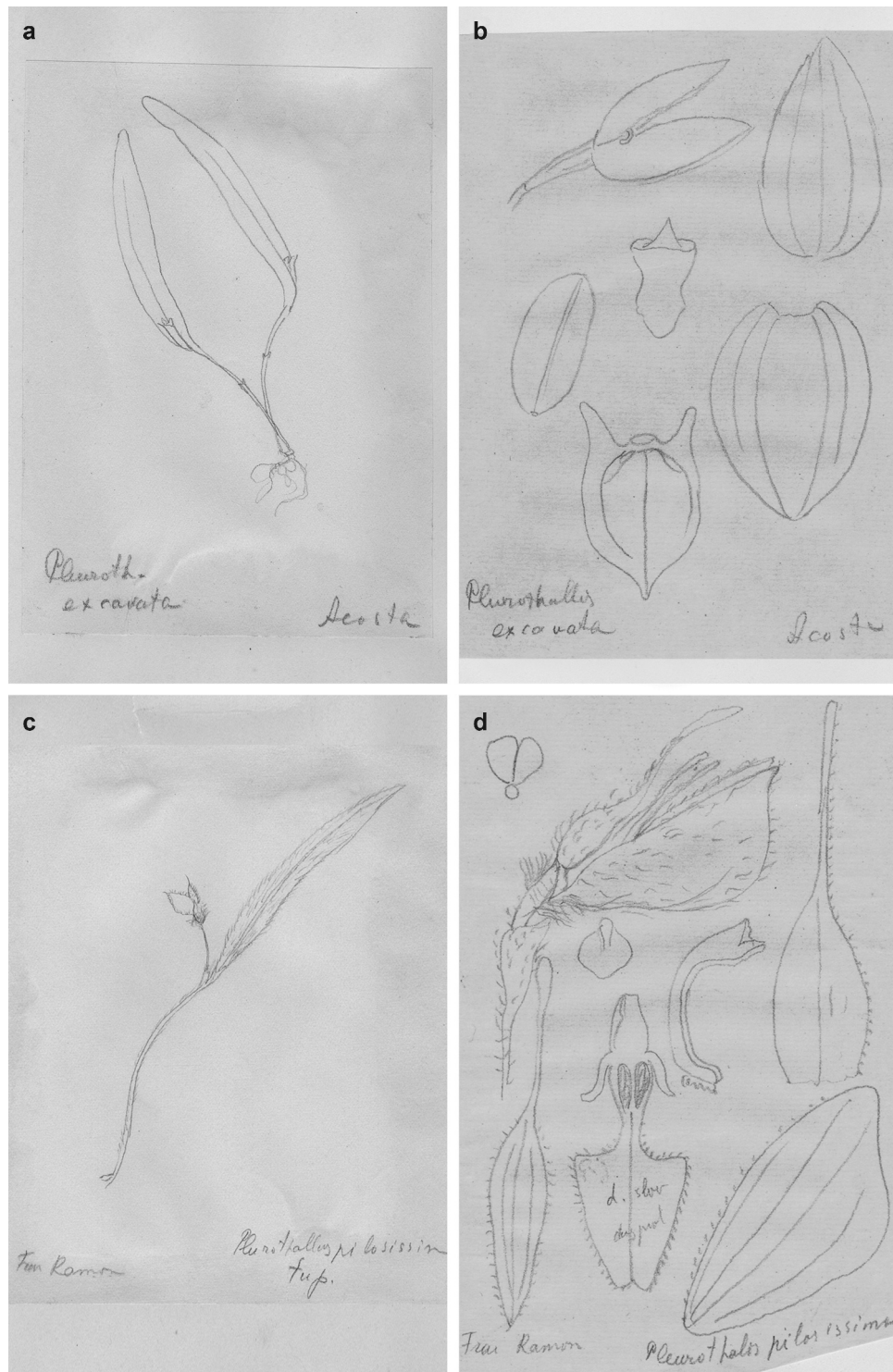


Figure 9. A. *Pleurothallis excavata* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,280), b. *Pleurothallis excavata* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,280), c. *Pleurothallis pilosissima* Schltr. Tracing of Schlechter's drawing of a stem of the plant habit from the holotype (AMES 31,281), d. *Pleurothallis pilosissima* Schltr. Tracing of Schlechter's analysis of the flower from the holotype (AMES 31,281). All images are reproduced with the kind permission of the Harvard University Herbaria.

of *Dresslerella pilosissima* (Schltr.) Luer. This species is endemic to Costa Rica, occurring infrequently in the Cordillera de Tilarán at elevations of about 100–1200 m.

19. *Ramonia pulchella* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 295. 1923.

≡ *Scaphyglottis pulchella* (Schltr.) L.O. Williams, Ann. Missouri Bot. Gard. 28: 424. 1941.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, G. Acosta s.n., B, destroyed (Lectotype: designated by de Retana DE and Atwood (1993b)), tracings of Schlechter's drawings of the

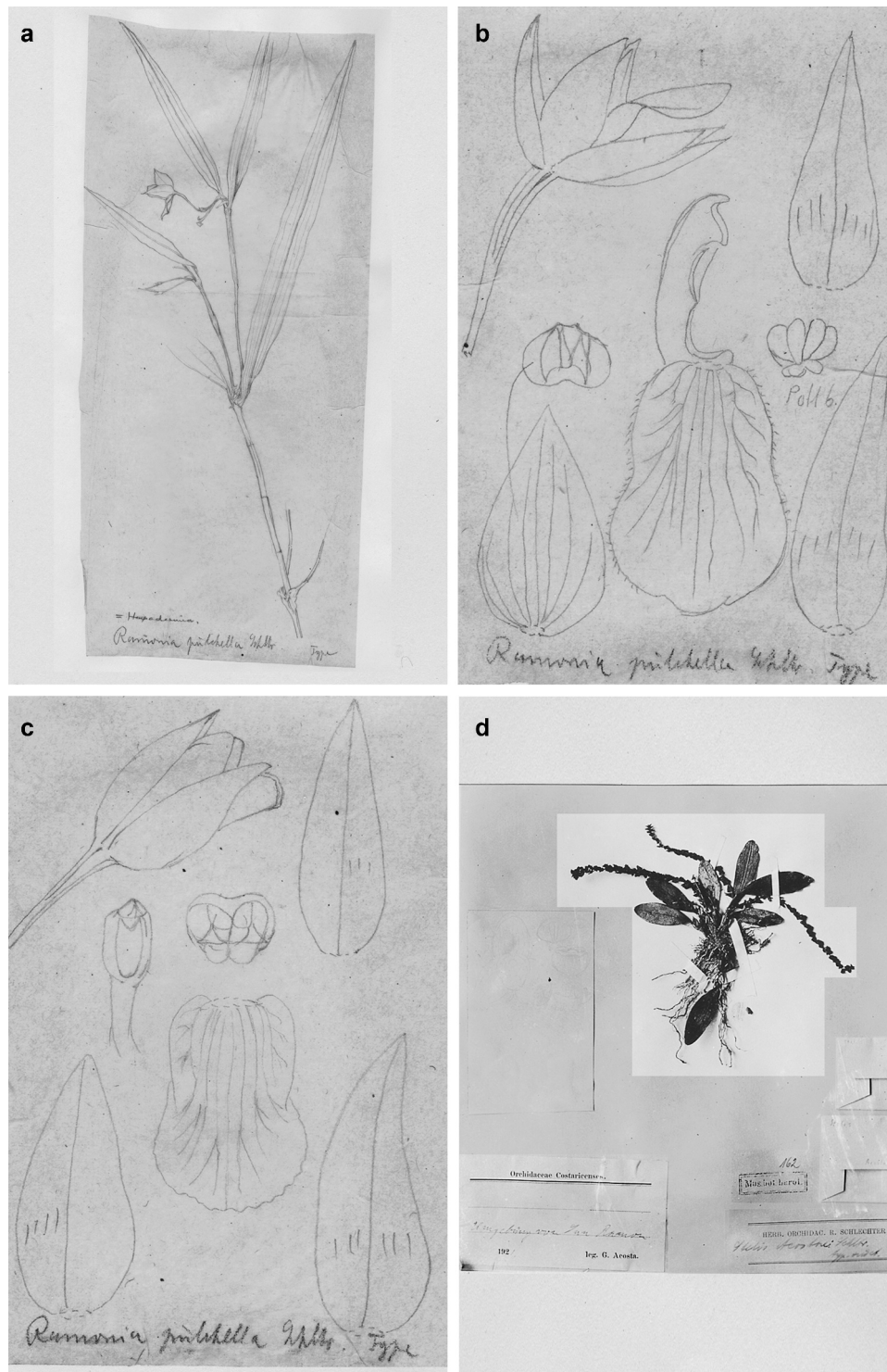


Figure 10. A. *Ramonia pulchella* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 31,274), B. *Ramonia pulchella* Schltr. Tracing of Schlechter's analysis of a flower from the holotype (AMES 31,274), C. *Ramonia pulchella* Schltr. Tracing of Schlechter's analysis of another flower from the holotype (AMES 31,274), D. *Stelis acostae* Schltr. Photograph of the holotype (AMES 30,430). All images are reproduced with the kind permission of the Harvard University Herbaria.

holotype, AMES-31274, barcode 00103754). (Figure 10A–C).

Notes: – Mora de Retana & Atwood (de Retana DE and Atwood 1993b) cited the word “type” and the herbarium where the original material is kept (AMES). Therefore, this constitutes a typification under Art. 7.11. As no isotypes, paratypes, or any

other type material of this species were found, the only material available are the tracings of Schlechter's drawings of the holotype. The sheet at AMES contains three drawings. The one on the left is a stem with superimposed pseudobulbs and linear-elliptic leaves, and one flower at the apex of the pseudobulb (Figure 10A). The drawings on the right are

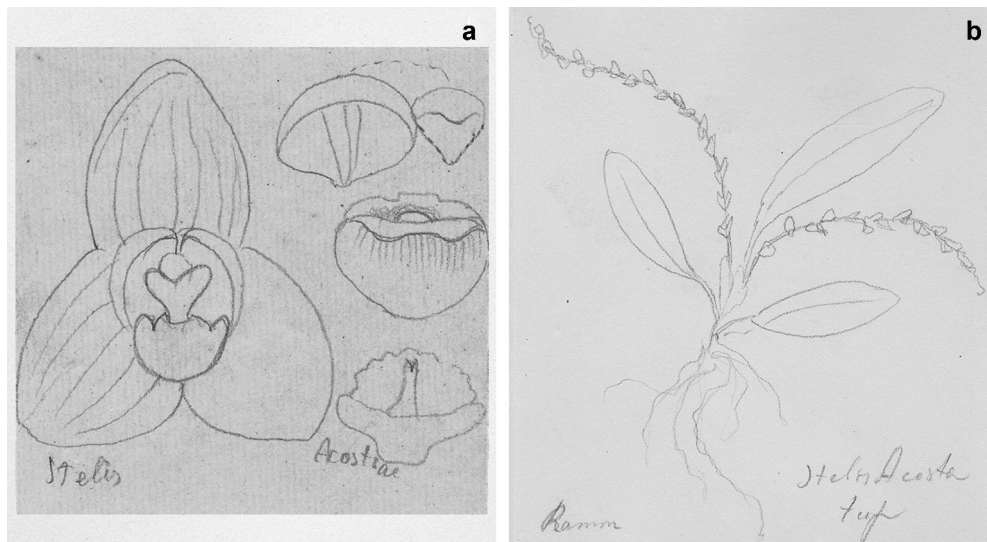


Figure 11. A. *Stelis acostae* Schltr. Tracing of Schlechter's analysis of a flower from the holotype (AMES 30,430), b. *Stelis acostae* Schltr. Tracing of Schlechter's drawing of the plant habit from the holotype (AMES 30,430). All images are reproduced with the kind permission of the Harvard University Herbaria.

two flowers with their respective dissections (Figure 10B–C). Both show the ovate-lanceolate sepals and petals and the pandurate, obtuse, sessile lip. Both drawings correspond to the same collection as Schlechter (1923) stated that “my material is in general quite good and complete, but there are only three flowers present, because I have to sacrifice two for analysis”. Therefore, *Ramonia pulchella* was proposed as the *typus generis* of *Ramonia* Schltr. The species is currently treated under *Scaphyglottis* Poepp. & Endl (Dressler et al. 2004).

20. *Restrepia angustilabia* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 290–291. 1923. **Type:** – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Lectotype: designated by Luer (1996) [MO]).

= *Restrepia trichoglossa* F. Lehm. ex Sander, Sander's Orch. Guide. 215. 1901.

Notes: – Neither specimens referable to *R. angustilabia* nor any other original material associated with the protologue have been found. Furthermore, the tracings of Schlechter's drawings of the holotype at AMES were not located. Consequently, Luer (1996, p. 136) selected a specimen deposited at MO as a neotype for *R. angustilabia*, but did not provide any permanent and unambiguous identifying number for the neotype (see Rec. 9C.1 in Turland et al. 2018). No specimen referable to the neotype of *R. angustilabia* was located in the TROPICOS database (www.tropicos.org). Furthermore, Luer (1996, p. 136) noted that “cultivated at Lankester Gardens,

C. Luer 16,861 (Neotypes of *R. angustilabia* and *R. subserrata* here designated: MO)” which should correspond to MO–2092564 (<https://www.tropicos.org/specimen/3460684>). This suggests that Luer (1996) neotypified both *R. angustilabia* and *R. subserrata* using the same herbarium sheet.

Restrepia angustilabia has been classified within a species complex morphologically related to *R. trichoglossa* F. Lehm. ex Sander. This species complex, which ranges from Mexico to Peru, encompasses at least seven conspecific species (Luer 1996). The complex poses taxonomic challenges due to high morphological variability within populations, particularly concerning flower color and shape. In Costa Rica, mixed populations of striped and spotted color-forms occur in San Ramón, the type locality of both *R. angustilabia* and *R. subserrata*. In certain regions, one of the two forms may be more frequent (Luer 1996). Schlechter (1923) distinguished *R. angustilabia* from *R. subserrata* Schltr. based on its entire petals and the narrower and subobtuse “stumpflche” lip. *Restrepia subserrata* is considered a synonym of *R. trichoglossa* (Luer 1996).

21. *Restrepia subserrata* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 291. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, G. Acosta s.n., holotype, B, destroyed (Neotype: designated by Luer (1996); COSTA RICA. From Lankester Garden, without collection data, flowered in cultivation at Colomborquideas. Synsepal yellow with thin,

Table 1. Collections by Guillermo Acosta cited by Schlechter (1923) and references to the lectotypes, neotypes and figures of the specimens.

Number	Name	Locality	Date	Typification	Specimen
s.n	<i>Acostaea costaricensis</i> Schltr.	Umgebung von San Ramón	1921	Pupulin (2010b)	AMES–29708, Figure 2A–B
s.n	<i>Acostaea plaurothalloides</i> Schltr.	Umgebung von San Ramón	1921	here designated	AMES–31277, Figure 2C–D
s.n	<i>Barbosella brenesii</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Barbosella prorepens</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Barkeria lindleyana</i> Bateman ex Lindl.	Umgebung von San Ramón	1921	-	-
s.n	<i>Camaridium ctenostachys</i> (Rchb.f.) Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Cryptophoranthus pectinatus</i> Schltr.	Umgebung von San Ramón	1921	Solano (2015) (as neotype)	AMES–31559, Figure 3A–B
s.n	<i>Dichaea acostae</i> Schltr.	Umgebung von San Ramón	1921	Pupulin (2007)	AMES–40542, Figure 3C–D
s.n	<i>Dichaea similis</i> Schltr.	Umgebung von San Ramón	1921	here designated	AMES–40552, Figure 4A–B
s.n	<i>Epidendrum equitans</i> Lindl.	Umgebung von San Ramón	1921	-	-
s.n	<i>Epidendrum trianthum</i> Schltr.	Umgebung von San Ramón	1921	Santiago and Hågsater (2008)	AMES–31638, Figure 4C–D
s.n	<i>Goodyera micrantha</i> Schltr.	Umgebung von San Ramón	1921	here designated	AMES–31634, Figure 5A–B
s.n	<i>Hexadesmia acostae</i> Schltr.	Umgebung von San Ramón	1921	de Retana DE and Atwood (1989)	AMES–26769, Figure 5C–D
s.n	<i>Hexadesmia</i> sp.	Umgebung von San Ramón	1921	-	-
s.n	<i>Kefersteinia microcharis</i> Schltr.	Umgebung von San Ramón	1921	Pupulin (2001)	AMES–40556, Figure 6A
s.n	<i>Kefersteinia subquadrata</i> Schltr.	Umgebung von San Ramón	1921	Pupulin (2010a)	AMES–40057, Figure 6B
s.n	<i>Lepanthes acostae</i> Schltr.	Umgebung von San Ramón	1921	here designated	AMES–31620, Figure 6C–D
s.n	<i>Lepanthes lancifolia</i> Schltr.	Umgebung von San Ramón	1921	Luer (2023) (as neotype)	AMES–31685, Figure 7A–B
s.n	<i>Lepanthes pubilabia</i> Schltr.	Umgebung von San Ramón	1921	here designated	AMES–31251, Figure 7C–D
s.n	<i>Lepanthes tonduziana</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Masdevallia tenuicauda</i> Schltr.	Umgebung von San Ramón	s.d.	-	-
s.n	<i>Maxillaria acostae</i> Schltr.	Umgebung von San Ramón	1921	Atwood and Mora-Retana (1999) (as neotype)	AMES–40543, Figure 8A
s.n	<i>Maxillaria ramonensis</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Maxillaria schisosteles</i> Schltr.	Umgebung von San Ramón	1921	Atwood and Mora-Retana (1999)	AMES–118027, Figure 8B
s.n	<i>Ornithidium anceps</i> Rchb.f.	Umgebung von San Ramón	1921	-	-
s.n	<i>Ornithidium pallidiflavum</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Ornithidium wercklei</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Pleurothallis acostae</i> Schltr.	Umgebung von San Ramón	1921	Luer (2005)	AMES–56388, Figure 8C–D
s.n	<i>Pleurothallis ehrhartiiiflora</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Pleurothallis excavata</i> Schltr.	Umgebung von San Ramón	1921	Luer (2005)	AMES–31280, Figure 9A–B
s.n	<i>Pleurothallis luctuosa</i> Rchb.f.	Umgebung von San Ramón	1921	-	-
s.n	<i>Pleurothallis naraniensis</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Pleurothallis pilosissima</i> Schltr.	Umgebung von San Ramón	1921	de Retana DE and Atwood (1993a)	AMES–31281, Figure 9C–D
s.n	<i>Ponthieva brenesii</i> Schltr.	Umgebung von San Ramón	s.d.	-	-
s.n	<i>Ramonia pulchella</i> Schltr.	Umgebung von San Ramón	1921	de Retana DE and Atwood (1993b)	AMES–31274, Figure 10A–C
s.n	<i>Restrepia angustilabia</i> Schltr.	Umgebung von San Ramón	1921	Luer (1996) (neotype)	MO-sn
s.n	<i>Restrepia subserrata</i> Schltr.	Umgebung von San Ramón	1921	Luer (1996) (neotype)	MO–2092564
s.n	<i>Stelis acostae</i> Schltr.	Umgebung von San Ramón	1921	here designated	AMES–30430, Figures 10D, 11A–B
s.n	<i>Stelis costaricensis</i> Schltr.	Umgebung von San Ramón	1921	-	-
s.n	<i>Stelis jimenezii</i> Schltr.	Umgebung von San Ramón	1921	-	-

brown lines, disappearing toward the apex, 16 May 1993–19 May 1993, *Carl A. Luer* 16,861 [MO–2092564]).

= *Restrepia trichoglossa* F. Lehm. ex Sander, Sander's Orch. Guide. 215. 1901.

Notes: – Due to the absence of original material, Luer (1996) selected a neotype for *R. subserrata*. In the protologue, Schlechter (1923) distinguished *R. subserrata* from *R. angustilabia* based on the slightly longer flowers, longer and irregularly serrated petals at the front-edge, and almost sawn, tridentate, truncate lip. Schlechter (1923) also noted that the synsepal is striped rather than spotted, but this feature seems to be variable and can transition into spotted forms of *R. trichoglossa* (Luer 1996). As a result, both *R. angustilabia* and *R. subserrata* are currently considered synonyms within a broad concept of *R. trichoglossa*.

A comprehensive study of natural variation and population genetics is necessary to determine whether the interpretations of *R. angustilabia* and *R. subserrata*, based on Acosta's material and several other species classified within the *R. trichoglossa* complex, represent distinct species. Furthermore, it is important to assess if the neotype selected by Luer (1996) conflicts with the protologue (see Art. 9.19 in Turland et al. 2018). Interestingly, it appears that *R. subserrata*, like *R. angustilabia*, has been neotypified by Luer (1996) using the same herbarium sheet. However, we were unable to ascertain if the sheet bears more than one plant specimen.

22. *Stelis acostae* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 278. 1923.

Type: – COSTA RICA. [Alajuela]: Umgebung von San Ramon, im Jahre 1921, *G. Acosta s.n.*, holotype, B, destroyed. (Lectotype: photograph of the holotype and associate drawing, AMES–30430, barcode 00090507, designated here). (Figures 10D, 11A–B).

Notes: – The lectotype of this species was selected based on the tracings of Schlechter's drawings and a photo of the holotype, because no isotypes, paratypes, or other type material exist. Schlechter (1923) distinguished *S. acostae* based on its long protruding inflorescences and the broad conspicuous bracts, which are depicted in the drawing of the plant at the top left (Figure 11B) and the picture of the holotype taken at B (Figure 10D). These images highlight the distinctive inflorescences and the characteristic bracts. The flower dissection (Figure 11A) showing the details of the sepals, petals, and subreniform lip also matches the protologue.

Schlechter (1923) dedicated several species to Guillermo Acosta, using the specific epithet *acostaei*. However, it must be corrected to *acostae* according to

Article 60.8 and Recommendation 60C.1. of the International Code of Nomenclature for algae, fungi, and plants (Shenzhen code) (Turland et al. 2018).

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Author contributions

Diego Bogarín, conceived the study, collected and analyzed information, wrote and reviewed the manuscript.

Carlos Ossenbach, wrote and reviewed the manuscript.

Noelia Belfort-Oconitrillo collected and analyzed information and reviewed the manuscript.

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