

THE TYPE SPECIMENS OF BROMELIACEAE IN THE HERBARIUM OF THE INSTITUTE OF SYSTEMATIC BOTANY OF THE UNIVERSITY OF HEIDELBERG, GERMANY

ELVIRA GROSS

Inselstr. 11, D-53332 Bornheim, Germany

ABSTRACT. The herbarium of the Institute of Systematic Botany of the University of Heidelberg (Germany) (HEID) contains a large collection of bromeliads. The scientific research of Prof. Werner Rauh in this plant family resulted in the description of many new species. Hence the type material in the herbarium has grown up to 228 taxa.

This type material is described in this paper. Scientific names and their authors, protologue citations and collecting data are given. Supplemental information refers to taxonomic changes.

INTRODUCTION

The Botanical Garden of the University of Heidelberg (Germany) (hereinafter referred to as BGH) has one of the greatest collections of living bromeliads. This is the result of many years of collecting work which was done mainly by Prof. Werner Rauh. But not only living material reached the BGH but also herbarium specimens. Many bromeliads were new to science and described by Prof. Rauh and others and so the type material in the herbarium increased steadily.

Unfortunately no registration exists. Therefore this paper gives a survey of the bromeliad types, deposited in the herbarium of the Institute of Systematic Botany of the University of Heidelberg (acronym: HEID).

All entries are arranged alphabetically at all levels: Bromelioideae, Pitcairnioideae, Tillandsioideae. After the scientific name and the author follows the publication source. The type status and collection data are given including a short description of the herbarium sheets. Further information refers to the relationship of the species, whether there is still living material cultivated in the BGH, and in case of taxonomic changes the now correct name.

RESULTS

Bromelioideae

Aechmea esseri Gross et Rauh, Trop. Subtrop. Pflanzenwelt 58: 53–55, Abb. 30, 1986.

HOLOTYPE: HEID, Paraguay, Dept. Amambay, Cerro Guazú (Arroyo Guazú); leg. G. Esser s. n., BGH 14 814, December 1966; det. E. Gross and W. Rauh; flowered in the BGH and conserved in July 1985.

Two sheets: (1) rosette base with two leaves, (2) inflorescence and one leaf.

Must be treated as synonym of *Aechmea dealbata* Baker (Gross 1995, 1997).

Cultivated in the BGH.

Aechmea smithiorum Mez var. **longistipitata** Gross, J. Bromeliad Soc. 35(6): 262–264, Figs. 9, 10, 1985.

HOLOTYPE: HEID, Windward Islands, St. Vincent, Baleine Falls, northwards to Windsor Forest, 100–250 m; leg. C. Innes s. n., BGH 30 845a, June 1972; det. E. Gross; flowered in the BGH and conserved in January 1985.

Two sheets: (1) single leaf, (2) inflorescence.

Cultivated in the BGH.

Aechmea wuelfinghoffii E. Gross, Die Bromelie 1/98: 13–15, 1 Abb., 1998.

HOLOTYPE: HEID, Ecuador, Prov. Morona-Santiago, near Indanza, 600–800 m, growing epiphytically at the edge of a forest; leg. R. Wülfinghoff E96/351, November 1996; det. E. Gross.

One sheet: single leaf and empty infructescence; inflorescence and separated flowers in alcohol.

Billbergia domingomartinsis E. Gross, Trop. Subtrop. Pflanzenwelt 65: 65–67, Abb. 41, “1988,” 1989.

HOLOTYPE: HEID, Brasil, Estado Espírito Santo, Domingos Martins, 800 m, rainforest; leg. W. Rauh 67 529; det. E. Gross.

One sheet: inflorescence and two leaves.

This species is close to *B. distachia* (Vellozo) Mez.

Billbergia robert-readii E. Gross et Rauh, J. Bromeliad Soc. 37(2): 56–58, Fig. 3, 1987.

HOLOTYPE: HEID, Peru, Dept. Cuzco, region of the Hacienda Salvación, 500–600 m, growing epiphytically in rainforest; leg. W. Rauh 26 163, August 1971; det. E. Gross and W. Rauh; flowered in the BGH and conserved without date.

Two sheets: (1) single leaf, (2) inflorescence.

This species is close to *B. boliviensis* L. B. Smith and *B. alfonsi-joannis* Reitz.

Bromelia horstii Rauh, Trop. Subtrop. Pflanzenwelt 52: 71–76, Abb. 44–46, 1985.

HOLOTYPE: HEID, Brasil, Estado Mato Grosso, near Jaciara, growing on dry rocks in light forest; leg. L. Horst No. 7, BGH 59 861; det. W. Rauh; flowered in the BGH and conserved in June 1984.

One sheet: separated leaves, inflorescence longitudinally divided into halves; separated flowers in alcohol.

This species is close to *B. interior* L. B. Smith.

Cryptanthus caracensis Leme & E. Gross, Cryptanthus Soc. J. 7(4): 12–16, 1992.

PARATYPE: HEID, Brasil, Estado Minas Gerais, Santa Barbara, P.N. Caraca, near Mirante, 1,400 m, growing epilithic in "Campos Rupestres"; leg. E.M.C. Leme 1858 and P. Nahoum, February 1992; det. E.M.C. Leme and E. Gross.

One sheet: whole leaf-rosette with roots and inflorescence, and two separated leaves. HOLOTYPE: HB.

Cryptanthus colnagoi Rauh et E.M.C. Leme, J. Bromeliad Soc. 39(6): 258–260, Figs. 10–12, 1989.

HOLOTYPE: HEID, Brasil, Estado Bahia, near Potiragúa, 1,000 m, terrestrial; leg. E. Colnago s. n., BGH 69 073; det. W. Rauh and E.M.C. Leme.

Two sheets: (1 and 2) half of a longitudinally divided plant with roots.

NOTE: Systematic revision of *Cryptanthus*, *Cryptanthus colnagoi* Rauh et Leme, Det.: Ivón M. Ramírez, 1996. Missouri Botanical Garden Herbarium (MO).

This species is close to *C. schwackeanus* Mez.

Cryptanthus leopoldo-horstii Rauh, Trop. Subtrop. Pflanzenwelt 65: 68–72, Abb. 42 and 43, "1988," 1989.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, 12 km northwest of Diamantina, 1,000 m, growing in small crevices of sandstone rocks; leg. W. Rauh and K.-I. Horst 67 221, April 1986; det. W. Rauh.

Two sheets: (1) one half of a longitudinally divided plant, parts of flowers and base of the rosette, (2) one half of a longitudinally divided plant with roots and separated leaves.

NOTE: Systematic revision of *Cryptanthus*, *Cryptanthus leopoldo-horstii* Rauh,

Det.: Ivón M. Ramírez, 1996. Missouri Botanical Garden Herbarium (MO).

Inflorescence in alcohol.

This species is close to *C. seidelianus* W. Weber.

Hohenbergia leopoldo-horstii E. Gross, Rauh & E.M.C. Leme, J. Bromeliad Soc. 41(2): 66–68, Figs. 7, 8, 1991.

HOLOTYPE: HEID, Brasil, Estado Bahia, near Grão Mogul, growing terrestrially on sandstone rocks; leg. L. Horst HU 1147, BGH 56 715, June 1986; det. E. Gross, W. Rauh and E.M.C. Leme.

Two sheets: (1) one leaf, (2) inflorescence.

This species is close to *H. vestita* L.B. Smith.

Neoregelia aculeatosepala Rauh & Barthlott, Trop. Subtrop. Pflanzenwelt 16: 53–57, Abb. 29–31, 1976.

HOLOTYPE: HEID, Ecuador, Prov. Cañar, above Limón, 1,200 m, growing epiphytically in mountain-forest; leg. W. Rauh and W. Barthlott 34 892; det. W. Rauh and W. Barthlott.

Absent for loan; flowers in alcohol.

Currently named *Aechmea aculeatosepala* (Rauh & Barthlott) Leme (Leme 1997).

Neoregelia tarapotensis Rauh, Trop. Subtrop. Pflanzenwelt 52: 68–71, Abb. 42 and 43, 1985; as "*tarapotoensis*."

HOLOTYPE: HEID, Peru, Dept. San Martín, Tarapoto-Yurimaguas, 1,200 m, growing epiphytically in mountain-forest; leg. W. Rauh and K. von Bismarck 63 976, August 1983; det. W. Rauh.

One sheet: separated leaves; inflorescence in alcohol.

This species is close to *N. leviana* L.B. Smith.

Orthophytum burle-marxii L.B. Smith and R.W. Read var. *seabrae* Rauh, Trop. Subtrop. Pflanzenwelt 52: 79–82, Abb. 47 and 48, 1985.

HOLOTYPE: HEID, Brasil, Estado Bahia, near Seabra, 200 m, limestone-plateau rocks; leg. W. Rauh 56 497a; det. W. Rauh. Material in alcohol.

Orthophytum disjunctum L.B. Smith var. *angustibracteatum* Rauh, Trop. Subtrop. Pflanzenwelt 58: 56–58, Abb. 31, 1986; as "*angustibracteatum*."

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, near Jacuariti, 500 m, growing terrestrially on sandstone rocks; leg. W.

Rauh and L. Horst 55 328, September 1981; det. W. Rauh; flowered in the BGH and conserved in May 1983.

Two sheets: (1) separated leaves, (2) scape with leaves, and inflorescence.

var. **striatum** Rauh, Trop. Subtrop. Pflanzenwelt 60: 90–94, Abb. 64, 1987.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, valley of Seabra, growing on sandstone rocks; leg. L. Horst s. n., BGH 58 971, August 1982; det. W. Rauh; flowered in the BGH and conserved in August 1986.

One sheet: scape with inflorescence.

Cultivated in the BGH.

var. **variegatum** Rauh, Trop. Subtrop. Pflanzenwelt 58: 58–60, Abb. 32, 1986.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, Urundi, 800 m, growing on sandstone rocks; leg. W. Rauh and L. Horst 56 432, September 1981; det. W. Rauh.

Three sheets: (1 and 2) whole plant with roots and inflorescence, (3) whole plant with roots and inflorescence, and separated leaves.

var. **viridiflorum** Rauh, Trop. Subtrop. Pflanzenwelt 58: 60–63, Abb. 33, 1986.

HOLOTYPE: HEID, Brasil, probably Estado Minas Gerais, without locality; received from SPI Wiesbaden s. n., BGH 33 052; det. W. Rauh.

Five sheets: (1 and 2) part of the scape with leaves, (3 and 4) scape with leaves and inflorescence, (5) inflorescence; material in alcohol.

CLONOTYPE: HEID, flowered in the BGH and conserved without date.

Five sheets: (1) part of the scape with leaves, (2) separated leaves and inflorescence, (3 and 4) scape and inflorescence, (5) inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in March 1990.

One sheet: one leaf and inflorescence.

Cultivated in the BGH.

Streptocalyx colombianus L.B. Smith var. **laxus** E. Gross, Trop. Subtrop. Pflanzenwelt 65: 72–75, Abb. 44, “1988,” 1989.

HOLOTYPE: HEID, Colombia, Dept. Nariño, Orito, 2,000 m, growing terrestrially in rain-forest; leg. W. Rauh 37 422, May 1975; det. E. Gross.

Two sheets: (1) two leaves, (2) inflorescence.

CLONOTYPE: HEID; flowered in the BGH and conserved in September 1990.

One sheet: two leaves and inflorescence.

Currently named *Aechmea colombiana*

(L.B. Smith) Smith et Spencer var. *laxa* (E. Gross) Smith et Spencer (Smith & Spencer 1992).

Cultivated in the BGH.

Pitcairnioideae

Abromeitiella lotteae Rauh, Trop. Subtrop. Pflanzenwelt 42: 5–12, Abb. 1–5, 1983.

HOLOTYPE: HEID, Bolivia, Dept. Tarija, between Tarija and Navarez, Cumbre del Condor, 2,700 m, stony-grassy slopes; leg. H. and L. Hromadnik 5130, BGH 50 859, July 1979; det. W. Rauh; flowered in the BGH and conserved in February 1983.

One sheet: separated leaves and leaf-rosette, longitudinally divided into halves with inflorescence.

Currently named *Deuterocohnia lotteae* (Rauh) Spencer and Smith (Spencer & Smith 1992).

Cultivated in the BGH.

Abromeitiella scapigera Rauh et L. Hromadnik, Trop. Subtrop. Pflanzenwelt 60: 5–8, Abb. 1 and 2, 1987.

HOLOTYPE: HEID, in alcohol (lost), Bolivia, Dept. Potosi, valley of the Río Grande de Cotagaita, west of Palca Grande, 2,400 m, growing on steep rock walls; leg. H. and L. Hromadnik 5275, BGH 50 842, August 1979; det. W. Rauh and Hromadnik.

CLONOTYPE: HEID, flowered in the BGH and conserved in March 1991.

One sheet: separated leaves and inflorescence.

Currently named *Deuterocohnia scapigera* (Rauh & Hromadnik) Spencer and Smith (Spencer & Smith 1992).

Deuterocohnia brevispicata Rauh et L. Hromadnik, Trop. Subtrop. Pflanzenwelt 65: 5–8, Abb. 1–2, “1988,” 1989.

HOLOTYPE: HEID, Bolivia, Dept. Chusquisaca, near Serrania Inca Huasi, above Muyupampa, 1,300 m, terrestrial; leg. H. and L. Hromadnik 5213, BGH 50 836, July 1979; det. W. Rauh and Hromadnik; flowered in the BGH and conserved in July 1987.

Two sheets: (1) two leaves, (2) one leaf and part of the inflorescence with four spikes.

Cultivated in the BGH.

Deuterocohnia glandulosa E. Gross, Trop. Subtrop. Pflanzenwelt 75: 5–8, Abb. 1 and 2, 1990.

HOLOTYPE: HEID, Bolivia, Dept. Tachira, Prov. Gran Chaco, near Campo

Serere, way to Villa Montes; leg. L. Hromadnik 5167, BGH 50 830, July 1979; det. E. Gross.

One sheet: separated leaves and part of the inflorescence with six spikes.

This species is close to *D. haumanii* Castellanos.

Deuterocohnia meziana O. Kuntze var. **carmineo-viridiflora** Rauh, Trop. Subtrop. Pflanzenwelt 52: 20–23, Abb. 10–11, 1985.

HOLOTYPE: HEID, Bolivia, near Pochico, 1,700 m, stony slopes; leg. W. Rauh 40 642, May 1976; det. W. Rauh; flowered in the BGH and conserved in May 1981.

Three sheets: (1) one leaf, (2) two leaves, (3) part of the inflorescence (without flowers), and separated flowers.

Deuterocohnia recurvipetala E. Gross, Trop. Subtrop. Pflanzenwelt 79: 5–7, Abb. 1, 1991.

HOLOTYPE: HEID, Argentina, Cerro Colorado, 550 m; leg. W. Rauh 64 236; det. E. Gross; flowered in the BGH and conserved in July 1990.

One sheet: two leaves, part of the inflorescence with few flowers, and separated flowers.

This species is close to *D. longipetala* (Baker) Mez.

Dyckia beateae E. Gross and Rauh, Trop. Subtrop. Pflanzenwelt 79: 7–10, Abb. 2, 1991.

ISOTYPE: HEID, Brasilia, Estado Mato Grosso, Campo Cerrado Araguinha, growing on flat sandstone rocks; leg. P. Braun 560, BGH 68 105, July 1986; det. E. Gross and W. Rauh; flowered in BGH and conserved in February 1991.

One sheet: single leaf, scape, and inflorescence.

HOLOTYPE: HB.

This species is close to *D. microcalyx* Baker.

Dyckia brachystachya Rauh et E. Gross, Trop. Subtrop. Pflanzenwelt 65: 8–10, Abb. 3 and 4, “1988,” 1989.

HOLOTYPE: HEID, Brasil, Estado Bahia, near Jaccarata, 1,000 m, growing on quartzitic rocks; leg. W. Rauh 56 443a, September 1981; det. W. Rauh and E. Gross; flowered in the BGH and conserved in July 1984.

One sheet: two leaves and inflorescence.

This species is close to *D. oligantha* L.B. Smith.

Dyckia braunii Rauh, J. Bromeliad Soc. 40(1): 25–26, Fig. 13, 1990.

HOLOTYPE: HEID, Brasil, Estado Goiás, in the north of the Serra Geral do Paraná, 1,400 m, growing terrestrially on slopes which are covered with grasses and low bushes; leg. P. Braun and E. Esteves Pereira 690, BGH 68 106; det. W. Rauh.

One sheet: single leaf and inflorescence.

This species is close to *D. marnier-lapostollei* L.B. Smith.

Dyckia crassifolia Rauh, Trop. Subtrop. Pflanzenwelt 79: 10–11, Abb. 4, 1991.

HOLOTYPE: HEID, Bolivia, Samaipata-Sta. Cruz, 1,200 m, growing in a dry forest; leg. W. Rauh 40 670, 1976; det. W. Rauh; flowered in the BGH and conserved in July 1985.

One sheet: single leaf and inflorescence.

This species is close to *D. leptostachya* Baker.

Dyckia estevesii Rauh, J. Bromeliad Soc. 37(3): 120–122, Figs. 14, 15, 1987.

HOLOTYPE: HEID, Brasil, Estado Goiás, between Caiaponia and the Río Araguaia, 500 m, growing terrestrially in a dry valley; leg. E. Esteves Pereira s. n., BGH 67 420, September 1985; det. W. Rauh; flowered in the BGH and conserved in April 1988.

Nine sheets: (1–3) single leaf, (4–7) inflorescence, (8) two leaves without sheath and tip, (9) single leaf and inflorescence; parts of the inflorescence in alcohol.

Cultivated in the BGH.

Dyckia graomogulensis Rauh, Trop. Subtrop. Pflanzenwelt 65: 11–12, Abb. 5, “1988,” 1989, as “*granmogulensis*.”

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, near Grão Mogul, 25 km south of Milagro, growing between rocks; leg. W. Rauh 56 484, October 1981; det. W. Rauh; flowered in the BGH and conserved in July 1986.

Two sheets: (1 and 2) separated leaves, scape and inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved without date.

One sheet: separated leaves and inflorescence.

This species is close to *D. oligantha* L.B. Smith.

Dyckia lindevaldae Rauh, Trop. Subtrop. Pflanzenwelt 65: 12–17, Abb. 6–8, “1988,” 1989.

HOLOTYPE: HEID, Brasil, Estado Goiás, near Alto Paraíso, 800 m, terrestrial; leg. E. Esteves Pereira s. n., BGH 67 425; det. W. Rauh.

Material in alcohol.

This species is close to *D. marnier-lapostollei* L.B. Smith.

Dyckia marnier-lapostollei L.B. Smith var. **es-tevesii** Rauh, Trop. Subtrop. Pflanzenwelt 53: 55–59, Abb. 26–28, 1985.

HOLOTYPE: HEID, Brasil, Estado Goias, south of Goiania, growing on rocks; leg. L. Horst No. 5, BGH 59 698; det. W. Rauh.

Two sheets: (1 and 2) single leaf and inflorescence.

Cultivated in the BGH.

Dyckia nervata Rauh, Trop. Subtrop. Pflanzenwelt 60: 21–24, Abb. 13 and 14, 1987.

HOLOTYPE: HEID, Brasil, Estado Bahia, near Jaccarata, 1,000 m, quartzitic rocks; leg. W. Rauh 56 443, September 1981; det. W. Rauh.

One sheet: single leaf and inflorescence.

This species is close to *D. oligantha* L.B. Smith.

Dyckia oligantha L.B. Smith var. **crystallina** Rauh, Trop. Subtrop. Pflanzenwelt 65: 17–18, Abb. 9, “1988,” 1989.

HOLOTYPE: HEID, Brasil, Estado Goias, near Cristallina, 800 m, growing on stony grassland; leg. W. Rauh 67 366, April 1986; det. W. Rauh; flowered in the BGH and conserved in January 1987.

One sheet: rosette with roots, longitudinally divided into halves, and inflorescence.

Encholirium carmineo-viridiflorum Rauh, Trop. Subtrop. Pflanzenwelt 60: 9–11, Abb. 3, 1987.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, southwest of Diamantina, 1,300 m, growing on rocks; leg. A.F.H. Buining and L. Horst s. n., BGH 31 086, August 1972; det. W. Rauh.

One sheet: separated leaves and inflorescence.

Encholirium inerme Rauh, Trop. Subtrop. Pflanzenwelt 60: 11–13, Abb. 4 and 5, 1987.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, Diamantina, 1,000 m, growing on quartzitic sand; leg. W. Rauh 67 158; det. W. Rauh.

Absent for loan; parts of the inflorescence in alcohol.

Encholirium suzannae Rauh, Trop. Subtrop. Pflanzenwelt 65: 19–22, Abb. 10 and 11, “1988,” 1989.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, near Conselheira Mata, 800 m,

growing terrestrially in rock crevices; leg. S. Marnier-Lapostolle and W. Rauh 67 197, April 1986; det. W. Rauh.

One sheet: separated leaves and inflorescence.

Encholirium sazimae Rauh, Trop. Subtrop. Pflanzenwelt 60: 99–102, Abb. 69–71, 1987.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, Serra do Cipó, 1,250 m, growing in crevices of rocks; leg. S. Vogel and I. Sazima 199; det. W. Rauh.

Absent for loan.

Encholirium vogelii Rauh, Trop. Subtrop. Pflanzenwelt 60: 95–98, Abb. 66–68 and 71, 1987.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, Serra do Cipó, 1,480 m; leg. S. Vogel and I. Sazima 209; det. W. Rauh.

Absent for loan.

Fosterella caulescens Rauh, Trop. Subtrop. Pflanzenwelt 31: 23–29, Abb. 11–13, 1979.

HOLOTYPE: HEID, Bolivia, between La Paz and Catanavia, 1,200 m, growing terrestrially in a mountain-forest; leg. W. Rauh 40 579a, August 1976; det. W. Rauh.

Seven sheets: (1 and 2) separated leaves, (3) scape, (4–7) inflorescence.

This species is close to *F. albicans* (Griesebach) Mez.

Cultivated in the BGH.

Fosterella heterophylla Rauh, Trop. Subtrop. Pflanzenwelt 60: 24–26, Abb. 15, 1987.

HOLOTYPE: HEID, Bolivia, Yungas near La Paz, 1,000 m; leg. W. Rauh 40 583a, August 1976; det. W. Rauh; flowered in the BGH and conserved in July 1986.

Two sheets: (1) separated leaves, (2) whole plant.

This species is close to *F. schidosperma* (Baker) L.B. Smith.

Cultivated in the BGH.

Fosterella vasquezii E. Gross and P. Ibsch, J. Bromeliad Soc. 47(5): 211–217, Figs. 6–11, 1997.

HOLOTYPE: HEID, Bolivia, Prov. Velasco, Dept. Santa Cruz, Parque Nacional Kempf Mercado, growing on steep sandstone rocks on the Serrania de Huanchaca, 200 m, nearby the El Encanto waterfall; leg. P. Ibsch No. 93.0652, C. Ibsch, G. Rauer and D. Rudolph; det. E. Gross and P. Ibsch.

Two sheets: (1) whole rosette with roots, (2) separated leaves and inflorescence.

ISOTYPE: LPB.

This species is close to *F. elata* H. Luther.

Cultivated in the BGH and B. G. Bonn.

Pepinia verrucosa E. Gross, Trop. Subtrop. Pflanzenwelt 95: 9–11, Abb. 2–4, 1997.

HOLOTYPE: HEID, Ecuador, Dept. Napo, Baeza-Lago Agrio; leg. W. Rauh 53 403a, July 1980; det. E. Gross; flowered in the BGH and conserved in March 1989.

Five sheets: (1–4) single leaf, (5) inflorescence and separated flowers.

This species is close to *P. carnososepala* (Rauh & Gross) Luther.

Cultivated in the BGH.

Pitcairnia albo-marginata Rauh, Trop. Subtrop. Pflanzenwelt 50: 29–32, Abb. 15 and 16, 1984.

HOLOTYPE: HEID, Ecuador, near Puyo, 1,500 m, growing on rocks in dense groups; leg. W. Rauh 52 920, June 1980; det. W. Rauh; flowered in the BGH and conserved in May 1983.

Two sheets: (1) whole plant with inflorescence, (2) whole plant with inflorescence, longitudinally divided into halves.

This species is a synonym of *P. hitchcockiana* L.B. Smith.

Pitcairnia atrorubens (Beer) Baker var. **pallido-bracteata** Gross et Rauh, Trop. Subtrop. Pflanzenwelt 58: 9–12, Abb. 4 and 4a, 1986.

HOLOTYPE: HEID, Panama, Cerro Jefe, 800 m, growing terrestrially in cloud-forest which is rich in palms; leg. W. Rauh 44 572, September 1977, det. E. Gross and W. Rauh; flowered in the BGH and conserved in July 1985.

Two sheets: (1) single leaf, (2) inflorescence, longitudinally divided into halves.

Pitcairnia aureobrunnea Rauh, Trop. Subtrop. Pflanzenwelt 50: 26–29, Abb. 13 and 14, 1984.

HOLOTYPE: HEID, Peru, Dept. San Martin, between Tarapoto and Yurimaguas, 500 m, growing on humid sandstone rocks; leg. W. Rauh 53 677, July 1980; det. W. Rauh; flowered in the BGH and conserved in May 1983.

Five sheets: (1 and 2) separated leaves, (3) inflorescence, (NOTE: L.B. Smith, June 23, 1988 “Ovules bicaudate”), (4 and 5) separated leaves and inflorescence, flowers only apically.

Pitcairnia brongniartiana André var. **scandens** Rauh, Trop. Subtrop. Pflanzenwelt 18: 27–31, Abb. 11–12, 1976.

HOLOTYPE: HEID, Ecuador, Prov. Esmeraldas, Rio Canadá, 20 km far from

Quinandé, 50 m, rain-forest; leg. W. Rauh 37 722, June 1975; det. W. Rauh.

Six sheets: (1 and 2) base of rosette with leaves, (3) single leaf and rhizome with roots, (4) piece of rhizome with roots and scape and basal part of the inflorescence, (5) central part of the inflorescence with fruits and anthetic flowers, (6) single leaf and apical part of the inflorescence.

Pitcairnia carnososepala Rauh et Gross, Trop. Subtrop. Pflanzenwelt 60: 26–32, Abb. 17–20a, 1987.

HOLOTYPE: HEID, Ecuador, near Shell Mera, Rio Pastaza, 500 m, forming dense groups at clayey slopes; leg. W. Rauh 52 808a, June 1980; det. W. Rauh and E. Gross.

Seven sheets: (1–3) single leaf, (4) base of rosette, longitudinally divided, (5) base of rosette, longitudinally divided, with leaves, (6 and 7) single leaf, and inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved without date.

Nine sheets: (1–4) single leaf, (5 and 6) base of rosette, longitudinally divided into halves, with leaves, (7–9) inflorescence.

Currently named *Pepinia carnososepala* (Rauh et Gross) Luther.

Pitcairnia fimbriato-bracteata Rauh, Trop. Subtrop. Pflanzenwelt 53: 48–51, Abb. 25 and 25a, 1985.

HOLOTYPE: HEID, Peru, Dept. Amazonas, between Nazareth and Imacita, 700 m, growing terrestrially in a degraded rain-forest; leg. W. Rauh and K. von Bismarck 40 180, June 1976; det. W. Rauh.

Three sheets: (1 and 2) single leaf, (3) separated leaves; material in alcohol.

This species is close to *P. quesnelioides* L.B. Smith.

Pitcairnia grafii Rauh, J. Bromeliad Soc. 38(4): 161–163, Figs. 9–11 and front cover, 1988.

HOLOTYPE: HEID, Venezuela, Estado Tachira, between El Capacho and San Antonio, 1,000 m, growing nearby a waterfall; leg. E. Graf s. n., BGH 64 680; det. W. Rauh.

Two sheets: (1) separated leaves, (2) separated leaves and inflorescence.

This species is close to *P. platypetala* Mez.

Cultivated in the BGH.

Pitcairnia heerdae E. Gross and Rauh, Trop. Subtrop. Pflanzenwelt 75: 11–13, Abb. 4 and 5, 1990.

HOLOTYPE: HEID, Colombia, south of

Bogotá, near Fusagasuga, growing terrestrially in a mountain-forest; leg. E. Heerde s. n., BGH 69 912, December 1988; det. E. Gross and W. Rauh.

One sheet: whole plant, rosette with roots, and inflorescence.

This species is close to *P. macarenensis* L.B. Smith.

Pitcairnia koeneniana E. Gross and Barthlott, Trop. Subtrop. Pflanzenwelt 95: 12–14, Abb. 6 and 7, 1997.

HOLOTYPE: HEID, Mexico, Estado Nayarit, between Ixtlan and Tepic, 380 m, growing on vertical cliffs at the volcano lake near Santa Maria del Oro, in the shadow of trees; leg. M. Koenen, B.G. Bonn 08382, December 1990; det. E. Gross; flowered in the B.G. Bonn and conserved in January 1992.

One sheet: separated leaves, scape and inflorescence.

This species is close to *P. loki-schmidtiae* Rauh et Barthlott.

Cultivated in the B.G. Bonn.

Pitcairnia loki-schmidtiae Rauh et Barthlott, Die Bromelie 2/87: 18–20, 3 Abb., 1987, as "*loki-schmidtii*."

HOLOTYPE: HEID, Mexico, Estado Jalisco, south of Puerto Vallarta, growing terrestrially on rocky slopes in a dry valley; leg. H. Schmidt s. n., B.G. Bonn 24.105, 1981; det. W. Rauh and W. Barthlott; flowered in the B.G. Bonn and conserved in January 1987.

Four sheets: (1 and 2) separated leaves, (3) plant with roots and inflorescence, (4) plant with inflorescence; material in alcohol.

Cultivated in the BGH.

Pitcairnia pallidoflavens Rauh, Trop. Subtrop. Pflanzenwelt 52: 23–26, Abb. 12 and 13, 1985.

HOLOTYPE: HEID, Peru, Dept. San Martin, between Tarapoto and Yurimaguas, 800 m, growing on steep, humid sandstone rocks; leg. W. Rauh 53 675, July 1980; det. W. Rauh.

Two sheets: (1) scape with basal part of inflorescence, (2) apical part of inflorescence.

TOPOTYPE: HEID; leg. W. Rauh 63 791, August 1983; det. W. Rauh.

Three sheets: (1–3) parts of inflorescence; material in alcohol.

This species is close to *P. odontopoda* Baker.

Pitcairnia piepenbringii Rauh et E. Gross, Die

Bromelie 1/88: 1–3, 3 Abb. and front cover, 1988.

HOLOTYPE: HEID, Brasil, Estado Bahia, 50 km south of Barreiras, 500 m, growing in crevices of sandstone rocks; leg. W. Rauh 67 430, May 1986; det. W. Rauh and E. Gross.

One sheet: whole plant with inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in September 1990.

One sheet: leaf-rosette with inflorescence.

This species is close to *P. torresiana* L.B. Smith.

Cultivated in the BGH.

Pitcairnia pomacocha Rauh, Trop. Subtrop. Pflanzenwelt 33: 23–27, Abb. 8 and 9, 1981.

HOLOTYPE: HEID, Peru, below the lagoon of Pomacocha, 1,200 m, mountain-forest; leg. W. Rauh 24 566, August 1970; det. W. Rauh.

Fifteen sheets: (1) rosette with roots, (2–4) separated leaves, (5) separated leaves and cataphylls, (6) part of the scape with bracts, (7 and 8) part of the scape and leaf, (9) inflorescence with few postfloral flowers, most flowers are fallen off, (10) part of the inflorescence, single leaf, and cataphylls, (11) part of the inflorescence and single leaf, (12 and 13) apical part of the inflorescence, (14 and 15) parts of the inflorescence; material in alcohol.

This species is close to *P. paniculata* Ruiz and Pavón.

Cultivated in the BGH.

Pitcairnia prolifera Rauh, Trop. Subtrop. Pflanzenwelt 60: 39–43, Abb. 26–28, 1987.

HOLOTYPE: HEID, Ecuador, Río Cotacachi, 800 m, growing epiphytically on *Ceiba pentandra*; leg. W. Rauh 35 292, September 1973; det. W. Rauh.

Two sheets: (1) plant with cataphylls and inflorescence, (2) plant with rhizome, roots, rosette-leaves and cataphylls, and inflorescence.

This species is close to *P. pungens* Humoldt, Bonpland and Kunth and *P. pavonii* Mez.

Pitcairnia pseudopungens Rauh, Trop. Subtrop. Pflanzenwelt 75: 13–15, Abb. 6, 1990.

HOLOTYPE: HEID, Peru, Dept. Amazonas, Río Marañón, above Balsas, 1,200 m, growing on rocks; leg. W. Rauh 52 797a, July 1980; det. W. Rauh, flowered in the BGH and conserved in July 1989.

Four sheets: (1) two plants with roots and leaf-rosette, (2) leaf-rosette longitudinally divided into halves and separated leaves, (3) leaf-rosette longitudinally divided into halves and inflorescence, (4) whole plant with roots and inflorescence.

This species is close to *P. pungens* Humboldt, Bonpland & Kunth.

Pitcairnia pseudo-undulata Rauh, Die Bromelie 3/85: 27–30, Abb. 1–4 and front cover, 1985.

HOLOTYPE: HEID, Peru, Dept. Amazonas, between Milagro and Imacita, 800 m, growing terrestrially in rain-forest; leg. W. Rauh 40 159, July 1976; det. W. Rauh.

Five sheets: (1) single leaf, (2) two leaves, (3) inflorescence and separated flowers, (4) whole plant with two leaves and inflorescence, (5) inflorescence.

This species is close to *P. undulata* Scheidweiler.

Pitcairnia rectiflora Rauh, Trop. Subtrop. Pflanzenwelt 52: 26–30, Abb. 15 and 16, 1985.

HOLOTYPE: HEID, Peru, Dept. San Martin, along the road Tarapoto-Yurimaguas, 800 m, growing terrestrially in mountain-forest; leg. W. Rauh 53 673, July 1980; det. W. Rauh.

Four sheets: (1–3) single leaf, (4) single leaf and inflorescence; material in alcohol.

CLONOTYPE: HEID, flowered in the BGH and conserved in April 1986.

Two sheets: (1) single leaf, (2) inflorescence.

Cultivated in the BGH.

Pitcairnia reflexiflora André var. **longipetala** E. Gross and Rauh, Trop. Subtrop. Pflanzenwelt 79: 14–17, Abb. 6 and 7, 1991.

HOLOTYPE: HEID, Ecuador, Dept. Azuay, between Gualaceo and San Juan del Bosque, 3,000 m, growing in mountain-forest; leg. K. Senghas s. n., BGH 66 976, January 1986; det. E. Gross and W. Rauh; flowered in the BGH and conserved in July 1990.

Two sheets: (1) two leaves, (2) scape with bracts and inflorescence.

Currently named *P. reflexiflora* André (Luther & Sieff 1997).

Cultivated in the BGH.

Pitcairnia roseoalba E. Gross and Rauh, Trop. Subtrop. Pflanzenwelt 95: 14–16, Abb. 8 and 9, 1997.

HOLOTYPE: HEID, Peru, Dept. La Libertad, in the valley of Canchaque, 1,200–1,800 m, forming dense groups on rocky

slopes; leg. W. Rauh 69 151, February 1988; det. E. Gross and W. Rauh; flowered in the BGH and conserved in July 1991.

Two sheets: (1) whole plant with roots and inflorescence, (2) whole plant with inflorescence.

CLONOTYPE: HEID; flowered in the BGH and conserved in September 1992.

One sheet: whole plant with inflorescence.

Cultivated in the BGH.

var. **rubra** E. Gross and Rauh, Trop. Subtrop. Pflanzenwelt 95: 14–16, Abb. 8 and 9, 1997.

HOLOTYPE: HEID, locality like in the var. *roseoalba*; leg. W. Rauh 69 151a, February 1988; det. E. Gross and W. Rauh; flowered in the BGH and conserved in October 1992.

Two sheets: (1) single leaf and inflorescence, (2) inflorescence.

This species is close to *P. decurvata* L.B. Smith.

Cultivated in the BGH.

Pitcairnia rubro-nigriflora Rauh, Trop. Subtrop. Pflanzenwelt 50: 32–36, Abb. 17 and 18, 1984.

HOLOTYPE: HEID, Peru, Dept. San Martin, above Tarapoto, 800 m, growing terrestrially in mountain-forest; leg. W. Rauh 53 676, July 1980; det. W. Rauh; flowered in the BGH and conserved in May 1983.

Five sheets: (1 and 2) single leaf, (3) single leaf and preanthetic inflorescence, (4) rosette with one leaf and inflorescence, (5) inflorescence, most flowers are fallen off.

CLONOTYPE: HEID, flowered in the BGH and conserved without date.

Two sheets: (1) single leaf, (2) two inflorescences, one only with two flowers.

CLONOTYPE: HEID, flowered in the BGH and conserved in July 1987.

Three sheets: (1 and 2) single leaf, (3) inflorescence, basal flowers are fallen off, apical flowers preanthetic.

Cultivated in the BGH.

Pitcairnia subfuscopetala Rauh and Hebding, Trop. Subtrop. Pflanzenwelt 75: 16–18, Abb. 7, 1990.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, valley of Río Chamaya near Chamaya, 700 m, growing in rock crevices; leg. W. Rauh 24 416, August 1970; det. W. Rauh and R. Hebding.

Four sheets: (1) separated leaves and cataphylls, (2) leaf and cataphylls and separat-

ed postanthetic flowers, (3 and 4) scape with bracts and inflorescence.

ISOTYPE: HEID.

Two sheets: (1) base of a plant and separated leaves, (2) base of a plant with scape and misdeveloped inflorescence.

This species is close to *P. stenophylla* André.

Pitcairnia undulato-sepala Rauh, Trop. Subtrop. Pflanzenwelt 58: 16–19, Abb. 8 and 9, 1986.

HOLOTYPE: HEID, Mexico, Estado Oaxaca, Oaxaca-Tehuantepec, 2,500 m, growing terrestrially in a dry forest; leg. W. Rauh 52 598, April 1980; det. W. Rauh; flowered in the BGH and conserved 1985.

Three sheets: (1) scape with bracts and inflorescence, (2) single leaf and inflorescence with few postanthetic flowers, (3) single leaf, inflorescence, and separated flowers.

This species is close to *P. megasepala* Baker.

Pitcairnia utcubambensis Rauh, Trop. Subtrop. Pflanzenwelt 65: 33–36, Abb. 20 and 21, "1988," 1989.

HOLOTYPE: HEID, Peru, Dept. Amazonas, valley of the Río Utcubamba, near Tingo Maria, 1,000 m, growing on sandstone rocks; leg. W. Rauh and K. von Bismarck 53 566, July 1980; det. W. Rauh.

One sheet: single cataphyll, single leaf and inflorescence.

This species is close to *P. trimorpha* L.B. Smith.

Pitcairnia villetaensis Rauh, Trop. Subtrop. Pflanzenwelt 60: 43–47, Abb. 29–31, 1987.

HOLOTYPE: HEID, Colombia, between Bogota and Villeta, 900 m, growing terrestrially in rain-forest; leg. W. Rauh 37 089, April 1975; det. W. Rauh; flowered in the BGH and conserved in April 1985.

Six sheets: (1–3) single leaf, (4) scape with bracts, (5) basal part of the inflorescence, (6) separated cataphylls and apical part of the inflorescence.

This species is close to *P. exserta* L.B. Smith.

Cultivated in the BGH.

Pitcairnia yaupi-bajaensis Rauh, Trop. Subtrop. Pflanzenwelt 43: 46–50, Abb. 28–30, 1983.

HOLOTYPE: HEID, Peru, Dept. Pasco, between Paucartambo and Yaupi-Baja, 1,800 m, growing terrestrially on stony grassland; leg. W. Rauh 25 718, July 1971;

det. W. Rauh; flowered in the BGH and conserved in January 1974.

Nine sheets: (1) two leaves, (2) part of scape with bracts, (3 and 4) leaf rosette, (5) apical part of leaves and basal part of the inflorescence, (6) single leaf and part of the inflorescence, (7–9) parts of the inflorescence.

This species is close to *P. odontopoda* Baker.

Cultivated in the BGH.

Puya angelensis E. Gross and Rauh, Trop. Subtrop. Pflanzenwelt 75: 18–21, Abb. 8 and 9, 1990.

HOLOTYPE: HEID, Ecuador, Prov. Carchi, between El Angel and San Isidro, near the Colombian border, 3,500 m, growing on steep rock-walls; leg. W. Rauh 34 522, July 1973; det. E. Gross and W. Rauh.

Two sheets: (1) separated leaves, (2) separated spikes.

This species is close to *P. parviflora* L.B. Smith.

Puya argentea L.B. Smith, Phytologia 5: 397, 1956.

ISOTYPE: HEID, Peru, Dept. Ancash, Cordillera Blanca, Quebrada Ulta, 3,000 m, growing on dry rocks; leg. W. Rauh and G. Hirsch P 2075, August 1954; det. L.B. Smith.

One sheet: single leaf and inflorescence longitudinally divided into halves.

HOLOTYPE: US.

Puya grafii Rauh, Trop. Subtrop. Pflanzenwelt 52: 5–14, Abb. 1–7, 1985.

HOLOTYPE: HEID, Venezuela, Prov. Amazonas, Yuta-Hé, growing on grassy-stony slopes; leg. E. Graf s. n., BGH 64 663; det. W. Rauh; flowered in the BGH and conserved in July 1984.

Three sheets: (1 and 2) rosette with roots longitudinally divided into halves, (3) two leaves and inflorescence.

Cultivated in the BGH.

Puya hromadnikii Rauh, Trop. Subtrop. Pflanzenwelt 41: 5–9, Abb. 1–3, 1983.

HOLOTYPE: HEID, Bolivia, between Tarija and Sta. Ana, 2,700 m, growing on grassy slopes; leg. H. and L. Hromadnik HR 5128, BGH 50 833, August 1979; det. W. Rauh.

One sheet: separated leaves and inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in August 1984.

Two sheets: (1) whole plant with inflo-

rescene, (2) separated leaves and two inflorescences.

Puya prosanae P. Ibsch and E. Gross, *J. Bromeliad Soc.* 43(5): 211–215, Figs. 9–12, 1993.

HOLOTYPE: HEID, Bolivia, Dept. Cochabamba, Prov. Arque, near Chapi-Chapi, 3,500–3,700 m, growing on stony ground; leg. P. and C. Ibsch 625A, B.G. Bonn 10 000, November 1991; det. P. Ibsch and E. Gross.

One sheet: whole plant with roots longitudinally divided into halves, one of the halves with inflorescence.

Cultivated in the BGH and B.G. Bonn.

Puya serranoensis Rauh, *Trop. Subtrop. Pflanzenwelt* 41: 14–19, Abb. 6, 1983.

HOLOTYPE: HEID, Bolivia, Dept. Sta. Cruz, between Villa Serrano and Rio Grande, 2,200 m, growing on grassy rocky slopes; leg. H. and L. Hromadnik HR 5230, BGH 50 831, July 1979; det. W. Rauh; flowered in the BGH and conserved in July 1981.

Three sheets: (1) separated leaves, (2) separated leaves without sheaths, (3) two leaves and inflorescence; material in alcohol.

var. ***brevispica*** Rauh, *Trop. Subtrop. Pflanzenwelt* 52: 15–17, Abb. 8, 1985.

HOLOTYPE: HEID, Bolivia, Dept. Sta. Cruz, between Villa Serrano and Rio Grande, 2,200 m, growing on grassy-rocky slopes; leg. H. and L. Hromadnik HR 5230, BGH 50 831a, July 1979; det. W. Rauh; flowered in the BGH and conserved in August 1984.

One sheet: separated leaves and inflorescence.

Puya vallo-grandensis Rauh, *Trop. Subtrop. Pflanzenwelt* 41: 9–14, Abb. 4 and 5, 1983.

HOLOTYPE: HEID, Bolivia, Dept. Sta. Cruz, between Loma Larga and Valle Grande, 2,000 m, growing on grassy rocky slopes; leg. H. and L. Hromadnik HR 5279, BGH 50 823; det. W. Rauh; flowered in the BGH and conserved in August 1981.

Three sheets: (1 and 2) separated leaves and inflorescence, (3) one spike; material in alcohol.

CLONOTYPE: HEID, flowered in the BGH and conserved without date.

One sheet: separated leaves and inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in November 1983.

One sheet: separated leaves and two inflorescences.

CLONOTYPE: HEID, flowered in the BGH and conserved in 1987.

Two sheets: (1) separated leaves, (2) inflorescence.

Cultivated in the BGH.

var. ***simplex*** Rauh, *Trop. Subtrop. Pflanzenwelt* 52: 18–20, Abb. 9, 1985.

HOLOTYPE: HEID, Bolivia, Dept. Sta. Cruz, between Loma Larga and Valle Grande, 2,000 m, growing on grassy rocky slopes; leg. H. and L. Hromadnik HR 5279, BGH 50 823a; det. W. Rauh; flowered in the BGH and conserved in August 1984.

Two sheets: (1 and 2) separated leaves and inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in June 1985.

One sheet: two inflorescences.

Puya werneriana R.W. Read and L.B. Smith, *Trop. Subtrop. Pflanzenwelt* 58: 5–9, Abb. 1 and 2, 1986.

HOLOTYPE: HEID, Peru, Dept. Junin, between Concepcion and Comas, valley of Satipo, 3,900 m, growing on grassy rocky slopes; leg. W. Rauh 25 891, August 1971; det. R.W. Read and L.B. Smith.

Five sheets: (1) two leaves without sheaths, (2) two leaves without sheaths and half of the scape, (3) other half of the scape and half of the inflorescence, (4) other half of the inflorescence, (5) two photographs, black and white, 13×18, which show the habit and the inflorescence at the type locality; material in alcohol.

Tillandsioideae

Catopsis pisiformis Rauh, *Trop. Subtrop. Pflanzenwelt* 42: 27–31, Abb. 16 and 17, 1983.

HOLOTYPE: HEID, Panama, El Valle de Antón, 900 m, growing epiphytically; leg. W. Rauh 58 635, July 1982; det. W. Rauh.

Absent for loan; material in alcohol.

Guzmania acutispica E. Gross, *Trop. Subtrop. Pflanzenwelt* 75: 27–30, Abb. 14 and 15, 1990.

HOLOTYPE: HEID, Peru, Dept. Amazonas, Pucallpa-Augayita, 300 m, growing in a palm-forest; leg. W. Rauh 23 879; det. E. Gross.

Three sheets: (1) single leaf, (2) scape and basal part of the inflorescence, (3) apical part of the inflorescence.

This species is close to *G. tarapotina* Ule.

- Guzmania alliodora** E. Gross, Trop. Subtrop. Pflanzenwelt 95: 18–20, Abb. 12, 1997.
HOLOTYPE: HEID, Peru, Dept. Pasco, Oxapampa, 1,800–2,200 m, growing in cloud-forest; leg. W. Rauh 20 942, October 1967; det. E. Gross.
One sheet: single leaf and two separated spikes.
This species is close to *G. sphaeroidea* (André) André ex Mez.
Cultivated in the BGH.
- Guzmania andreettae** Rauh, Trop. Subtrop. Pflanzenwelt 58: 46–48, Abb. 26, 1986.
HOLOTYPE: HEID, Ecuador, Prov. Morona-Santiago, Valle de Río Upano, 1,800 m, growing in cloud-forest; leg. Padre Andreetta s. n., BGH 53 008; det. W. Rauh; flowered in the BGH and conserved in December 1985.
Five sheets: (1–3) separated leaves, (4 and 5) scape with inflorescence, longitudinally divided into halves.
This species is close to *G. coriostachya* (Grisebach) Mez and *G. vittata* (Martius ex Schultes f.) Mez.
- Guzmania barbieae** Rauh, Trop. Subtrop. Pflanzenwelt 53: 46–48, Abb. 24, 1985.
HOLOTYPE: HEID, Ecuador, Guayaquil-Carretera Panamericana, 5 km east of Bucay, 400 m, terrestrial; leg. J. Barbie s. n., BGH 58 428; det. W. Rauh.
One sheet: separated leaves and inflorescence.
Cultivated in the BGH.
- Guzmania bismarckii** Rauh, Trop. Subtrop. Pflanzenwelt 50: 19–22, Abb. 8 and 9, 1984.
HOLOTYPE: HEID, Peru, Dept. San Martín, 20 km west of Rioja, 800 m, growing terrestrially in rain-forest; leg. W. Rauh and K. von Bismarck 63 679, August 1983; det. W. Rauh.
Four sheets: (1 and 2) single leaf, (3) parts of the inflorescence, (4) scape and infructescence; parts of the inflorescence in alcohol.
This species is close to *G. lindenii* (André) Mez.
- Guzmania blassii** Rauh, Trop. Subtrop. Pflanzenwelt 42: 24–27, Abb. 14 and 15, 1983.
HOLOTYPE: HEID, Costa Rica, without locality, growing in rain-forest; leg. C. Horich s. n., BGH 55 238; det. W. Rauh.
Two sheets: (1 and 2) single leaf and inflorescence, longitudinally divided into halves.
- CLONOTYPE: HEID, flowered in the BGH and conserved without date.
One sheet: inflorescence.
- Guzmania butcheri** Rauh, Trop. Subtrop. Pflanzenwelt 65: 42–45, Abb. 27, 1988.
HOLOTYPE: HEID, Panama, Prov. Chiriquí, near El Boquete, 1,000 m, growing epiphytically in mountain-forest; leg. Butcher s. n., BGH 59 033, June 1984; det. W. Rauh.
Two sheets: (1) separated leaves and base of the rosette with roots, (2) separated leaves and inflorescence.
Cultivated in the BGH.
- Guzmania cerifera** Rauh and Barthlott, Trop. Subtrop. Pflanzenwelt 16: 49–53, Abb. 26–28, 1976.
HOLOTYPE: HEID, Ecuador, Loja-Zamora, 1,400 m, growing in mountain-forest; leg. W. Rauh and W. Barthlott 35 226; det. W. Rauh and W. Barthlott.
Two sheets: (1) separated leaves, (2) inflorescence and infructescence.
This species is close to *G. bipartita* L.B. Smith.
Cultivated in the BGH.
- Guzmania circinnata** Rauh, Trop. Subtrop. Pflanzenwelt 60: 48–51, Abb. 33 and 34, 1987.
HOLOTYPE: HEID, Panama, Prov. Panama, Cerro Jefe, 800 m, growing epiphytically in cloud-forest; leg. W. Rauh 44 560, October 1977; det. W. Rauh.
Two sheets: (1) single leaf and two spikes, (2) inflorescence.
This species is close to *G. squarrosa* (Mez & Sodiro) L.B. Smith and Pittendrigh and *G. gloriosa* (André) André ex Mez.
- Guzmania confusa** L.B. Smith var. *foetida* Rauh, Trop. Subtrop. Pflanzenwelt 31: 21–23, Abb. 10, 1979.
HOLOTYPE: HEID, Ecuador, Prov. Napo, above the waterfall at the Rio Coca, 2,000 m, growing in mountain-forest; leg. W. Rauh 37 560; det. W. Rauh; flowered in the BGH and conserved in July 1979.
Two sheets: (1) separated leaves and scape, (2) separated leaves and inflorescence, longitudinally divided into halves.
- Guzmania foetida** Rauh, Trop. Subtrop. Pflanzenwelt 69: 52–55, Abb. 35 and 36, 1987.
HOLOTYPE: HEID, Ecuador, Prov. Pastaza, near Baños, 1,200 m, growing terrestrially and epiphytically in mountain-forest; leg. W. Rauh 37 763, August 1975; det. W. Rauh.

One sheet: separated leaves and inflorescence.

This species is close to *G. coriostachya* (Grisebach) Mez.

Guzmania garciaensis Rauh, Trop. Subtrop. Pflanzenwelt 27: 16–18, Abb. 6, 1979.

HOLOTYPE: HEID, Peru, Dept. Amazonas, near Campamento Garcia, 2,000 m, growing in cloud-forest; leg. W. Rauh 38 613, September 1975; det. W. Rauh.

Two sheets: (1) two leaves and scape, (2) single leaf and inflorescence.

Guzmania glaucophylla Rauh, Trop. Subtrop. Pflanzenwelt 53: 43–46, Abb. 22 and 23, 1985.

HOLOTYPE: HEID, Peru, Dept. Pasco, along the road Oxapampa-Yaupi Baja, 2,000–2,300 m, growing terrestrially in cloud-forest; leg. W. Rauh and K. von Bismarck 66 031, August 1984; det. W. Rauh.

Five sheets: (1) rhizome, partly longitudinally divided, (2) rosette with leaves, longitudinally divided into halves and scape, (3) separated leaves and scape, (4) single leaf, (5) two inflorescences.

This species is close to *G. coriostachya* (Grisebach) Mez.

Cultivated in the BGH.

Guzmania lindenii (André) Mez var. **concolor** Rauh, Trop. Subtrop. Pflanzenwelt 43: 41–46, Abb. 26 and 27, 1983.

HOLOTYPE: HEID, Peru, Dept. Junin, between San Ramon and Oxapampa, 1,200 m, growing epiphytically in mountain-forest; leg. K. von Bismarck s. n., BGH 31 312, December 1972; det. W. Rauh; flowered in the BGH and conserved in July 1977.

Three sheets: (1) two leaves (only apices), (2) basal part of the inflorescence, (3) apical part of the inflorescence.

Guzmania remediosensis E. Gross, Trop. Subtrop. Pflanzenwelt 95: 20–21, Abb. 13, 1997.

HOLOTYPE: HEID, Bolivia, Dept. La Paz, Monte de Villa Remedios; leg. M. Miyagawa s. n., BGH 72 051, September 1990; det. E. Gross; flowered in the BGH and conserved in March 1992.

Two sheets: (1) two leaf-apices, one half of a longitudinally divided inflorescence, (2) single leaf and second half of the inflorescence.

This species is close to *G. besseae* Luther.

Cultivated in the BGH.

Guzmania rio-nievensis Rauh, Trop. Subtrop.

Pflanzenwelt 50: 22–26, Abb. 10 and 12, 1984.

HOLOTYPE: HEID, Peru, Dept. San Martin, below the pass Pomacocha-Rioja, 1,800 m, growing on humid rock-walls at the Río Nieve in cloud-forest; leg. W. Rauh and K. von Bismarck 63 687a, July 1983; det. W. Rauh.

Three sheets: (1) scape, (2) basal part of the inflorescence, (3) apical part of the inflorescence; parts of the inflorescence in alcohol.

ISOTYPE: HEID.

One sheet: part of the infructescence.

var. **laxiflora** Rauh, Trop. Subtrop. Pflanzenwelt 50: 22–26, Abb. 11 and 12, 1984.

HOLOTYPE: HEID, Peru, Dept. San Martin, below the pass Pomacocha-Rioja, 1,800 m, growing on humid rock-walls at the Río Nieve in cloud-forest; leg. W. Rauh and K. von Bismarck 63 687b, July 1983; det. W. Rauh.

Two sheets: (1) scape and basal part of the infructescence, (2) apical part of the infructescence; parts of the inflorescence in alcohol.

Guzmania roseiflora Rauh, Trop. Subtrop. Pflanzenwelt 43: 38–40, Abb. 22, 1983

HOLOTYPE: HEID, Ecuador, Prov. Pichincha, Santo Domingo, 1,300 m, growing epiphytically in mountain-forest; leg. W. Rauh 38 056, June 1975; det. W. Rauh.

Two sheets: (1) single leaf, (2) scape and half of a longitudinally divided inflorescence. NOTE: “Die andere Hälfte an den Selby Garden, Luther, Sarasota, 4.3.82 geschickt.” (“The other half sent to the Selby Garden, Luther, Sarasota, 4.3.82.”); parts of the inflorescence in alcohol.

CLONOTYPE: HEID, flowered in the BGH and conserved in March 1983.

Two sheets: (1) separated leaves and scape, (2) inflorescence longitudinally divided into halves.

Cultivated in the BGH.

Guzmania rubro-lutea Rauh, Trop. Subtrop. Pflanzenwelt 27: 20–23, Abb. 8 and 9, 1979.

HOLOTYPE: HEID, Ecuador, Prov. Napo, between Baeza and Lago Agrio, waterfall of the Río Coca, 1,800 m, growing in mountain-forest; leg. W. Rauh 37 628, July/August 1975; det. W. Rauh.

Three sheets: (1) two leaves, (2) scape, (3) inflorescence; material in alcohol.

CLONOTYPE: HEID, flowered in the BGH and conserved without date.

Two sheets: (1) separated leaves, (2)

scape and inflorescence, longitudinally divided into halves.

CLONOTYPE: HEID, flowered in the BGH and conserved in April 1981.

Four sheets: (1) two leaves, (2) basal part of the scape, (3 and 4) half of the longitudinally divided inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in December 1982.

Three sheets: (1) single leaf, (2) half of the scape and basal part of the inflorescence, (3) half of the scape and apical part of the inflorescence.

Cultivated in the BGH.

Guzmania scherzeriana Mez var. **albiflora** Rauh, J. Bromeliad Soc. 36(4): 161–164, Figs. 8–11, 1986.

HOLOTYPE: HEID, Ecuador, Prov. Pichincha, Rio Pindo, 1,000 m, growing epiphytically in mountain-forest; leg. E. Patzelt s. n., BGH 54 791, July 1981; det. W. Rauh.

Two sheets: (1) single leaf, (2) scape and inflorescence.

Guzmania sprucei (André) L.B. Smith var. **dressleri** Rauh, Trop. Subtrop. Pflanzenwelt 33: 20–23, Abb. 7 and 7a, 1981.

HOLOTYPE: HEID, Panama, Prov. Panama, Cerro Jefe, 800 m, growing epiphytically in mountain-forest; leg. R. Dressler s. n., BGH 48 645, March 1979; det. W. Rauh; flowered in the BGH and conserved in November 1983.

One sheet: two leaves and inflorescence; material in alcohol.

Cultivated in the BGH.

Guzmania thyrsoidea Rauh, Trop. Subtrop. Pflanzenwelt 58: 50–53, Abb. 29, 1986.

HOLOTYPE: HEID, Costa Rica, Prov. Cartago, near Turrialba, growing epiphytically in mountain-forest; leg. L. Müller s. n., BGH 17 643; det. W. Rauh.

Three sheets: (1) single leaf, (2) two leaves, (3) inflorescence.

Guzmania undulato-bracteata (Rauh) Rauh, J. Bromeliad Soc. 41(1): 18–20, 24, Figs. 8–10, 1991.

HOLOTYPE: HEID, Peru, Dept. Pasco, valley of Oxapampa, 1,900 m, growing epiphytically and terrestrially in mountain-forest; leg. W. Rauh 25 825, July 1971; det. W. Rauh.

Six sheets: (1) single leaf, (2) single leaf and part of a leaf, (3) scape, (4) basal part of the inflorescence, (5) central part of the inflorescence, (6) drawing of a spike with bract; material in alcohol.

ISOTYPE: US.

CLONOTYPE: HEID, flowered in the BGH and conserved in September 1975.

Three sheets: (1) scape and basal part of the inflorescence, (2) central part of the inflorescence, (3) apical part of the inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in February 1990.

Three sheets: (1) two leaves and scape, (2) basal part of the inflorescence, (3) apical part of the inflorescence.

Basionym: *Tillandsia undulato-bracteata* Rauh, Trop. Subtrop. Pflanzenwelt 8: 6–14, Abb. 1–4, 1974.

Guzmania victoriae Rauh, Trop. Subtrop. Pflanzenwelt 18: 24–27, Abb. 9 and 10, 1976.

HOLOTYPE: HEID, Peru, Dept. Amazonas, between Progresso and Garcilla (km 372, Ingenio-Tarapoto), 2,200 m, growing terrestrially in dense cloud-forest; leg. W. Rauh 38 336, August 1975; det. W. Rauh.

Two sheets: (1) whole leaf-rosette with roots, (2) inflorescence; material in alcohol.

This species is close to *G. paniculata* Mez.

Guzmania viridiflora E. Gross, Trop. Subtrop. Pflanzenwelt 95: 21–23, Abb. 14, 1997.

HOLOTYPE: HEID, Peru, Dept. Amazonas, Prov. Mendoza, Omia, 1,800 m, growing epiphytically in mountain-forest; leg. W. Rauh 63 742, August 1983; det. E. Gross; flowered in the BGH and conserved in October 1986.

One sheet: separated leaves and inflorescence.

Guzmania zahnii (Hooker f.) Mez var. **longiscapa** Rauh, Trop. Subtrop. Pflanzenwelt 65: 45–47, Abb. 28, “1988,” 1989.

HOLOTYPE: HEID, Panama, Prov. Chiriqui, El Boquete, 1,500 m, growing epiphytically; leg. Butcher s. n., BGH 59 032, November 1982; det. W. Rauh.

Six sheets: (1–3) separated leaves, (4–6) inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in April 1990.

One sheet: separated leaves and inflorescence.

Cultivated in the BGH.

Mezobromelia lyman-smithii Rauh and Barthlott, Trop. Subtrop. Pflanzenwelt 16: 13–19, Abb. 6–9, 1976.

HOLOTYPE: HEID, Ecuador, Prov. Cotopaxi, between Quevedo and Latacunga, 1,800–2,000 m, growing epiphytically in cloud-forest; leg. W. Rauh and W. Barthlott

34 477, August 1973; det. W. Rauh and W. Barthlott.

Four sheets: (1) one leaf and part of the scape, (2 and 3) parts of the inflorescence, (4) copy of a drawing of a flower; material in alcohol.

Mezobromelia trollii Rauh, Trop. Subtrop. Pflanzenwelt 21: 5–10, Abb. 1–3a, 1977.

HOLOTYPE: HEID, Peru, Dept. Amazonas, between Chachapoyas and Mendoza (km 552–555), growing epiphytically in the mountain-forest at the Río Soncha; leg. W. Rauh 40 104, July 1976; det. W. Rauh.

Eleven sheets: (1) one leaf, (2) one leaf, scape, and part of the inflorescence, (3–9) parts of the inflorescence, (10 and 11) part of the scape and parts of the inflorescence; material in alcohol.

ISOTYPE: US.

Currently named *M. hutchisonii* (L.B. Smith) W. Weber and L.B. Smith (Weber & Smith 1983).

Cultivated in the BGH.

Tillandsia adpressa André var. **miniata** Rauh, Trop. Subtrop. Pflanzenwelt 13: 5–16, Abb. 1–4 and 6, 1974.

HOLOTYPE: HEID, Ecuador, Prov. Tungurahua, east of Baños towards Puyo, 1,200 m, growing epiphytically; leg. W. Rauh 34 820; det. W. Rauh.

One sheet: whole plant with five infructescences; material in alcohol.

Currently named *Racinaea miniata* (Rauh) J.R. Grant (Grant 1994a).

Tillandsia alfredo-lauii Rauh and Lehmann, Trop. Subtrop. Pflanzenwelt 41: 25–28, Abb. 11, 1983.

HOLOTYPE: HEID, Mexico, Estado Hidalgo, near Carboneras, 2,000 m, growing epiphytically; leg. A. Lau jun. s. n., BGH 55 204, December 1981; det. W. Rauh and H. Lehmann.

Two sheets: (1 and 2) separated leaves and inflorescence.

This species is close to *T. prodigiosa* (Lemaire) Baker.

Tillandsia almeriae Rauh, Trop. Subtrop. Pflanzenwelt 58: 19–21, Abb. 10, 1986.

HOLOTYPE: HEID, Colombia, between Ibaque and Almeria, 2,600 m, growing epiphytically in cloud-forest; leg. W. Rauh 37 152a, April 1975; det. W. Rauh, flowered in the BGH and conserved in August 1985.

One sheet: separated leaves and inflorescence.

Currently named *Racinaea almeriae* (Rauh) J.R. Grant (Grant 1993a).

Cultivated in the BGH.

Tillandsia alvarezii Rauh, Trop. Subtrop. Pflanzenwelt 58: 22–24, Abb. 11–14, 1986.

HOLOTYPE: HEID, Mexico, Estado Veracruz, probably near Fortín de las Flores; leg. Alvarez s. n., BGH 36 459; det. W. Rauh.

Two sheets: (1) whole plant with inflorescence, (2) whole plant with inflorescence, three separated inflorescences and leaf-rosette without inflorescence.

This species is close to *T. remota* Wittmack.

Tillandsia aurea Mez var. **minor** Hromadnik et Rauh, Trop. Subtrop. Pflanzenwelt 52: 65–68, Abb. 39 and 44, 1985.

HOLOTYPE: HEID, Peru, Dept. Amazonas, Río Marañón, near Balsas, 1,200 m, growing on rock-walls; leg. H. and L. Hromadnik 4206, BGH 58 324, May 1984; det. W. Rauh; flowered in the BGH and conserved without date.

One sheet: whole plant with inflorescence, separated leaves and two separated inflorescences.

Tillandsia bagua-grandensis Rauh, J. Bromeliad Soc. 37(6): 259–260, Fig. 10, 1987.

HOLOTYPE: HEID, Peru, Dept. Amazonas, Río Marañón, near Bagua Grande, 800 m, growing on rock-walls; leg. U. Perino s. n., BGH 54 227, July 1982; det. W. Rauh.

One sheet: whole plant with roots and inflorescence.

This species is close to *T. caulescens* Brongniart ex Baker.

Cultivated in the BGH.

Tillandsia balsasensis Rauh, Trop. Subtrop. Pflanzenwelt 18: 5–8, Abb. 1 and 2, 1976.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, Río Marañón, 12 km above Balsas, 1,700 m, growing on vertical sandstone cliffs; leg. W. Rauh 38 570, August 1975; det. W. Rauh.

One sheet: cluster of plants with roots, one plant with inflorescence; material in alcohol.

This species is close to *T. tectorum* E. Morren.

Tillandsia barthlottii Rauh, Trop. Subtrop. Pflanzenwelt 12: 12–21, Abb. 6–9 and 11, 1974.

HOLOTYPE: HEID, Ecuador, Prov. Morona-Santiago, Cuenca-Macas, near Sucua, 800–1,000 m, growing epiphytically; leg. W. Rauh and W. Barthlott 34 911, July 1973; det. W. Rauh.

Two sheets: (1) one leaf and parts of the inflorescence, (2) two leaves and parts of the inflorescence; material in alcohol.

- Tillandsia bismarckii** Rauh et Lehmann, Trop. Subtrop. Pflanzenwelt 41: 22–24, Abb. 10, 1983.
HOLOTYPE: HEID, Peru, Dept. San Martin, between Tarapoto and Yurimaguas, 1,000 m, growing epiphytically in mountain-forest (east side of the Andes); leg. K. von Bismarck s. n., BGH 53 653, July 1980; det. W. Rauh and H. Lehmann.
One sheet: two leaves and inflorescence.
- Tillandsia brenneri** Rauh, Trop. Subtrop. Pflanzenwelt 33: 12–14, Abb. 4, 1981.
HOLOTYPE: HEID, Ecuador, Prov. Pastaza, Puyo, 500 m, growing epiphytically in degraded rain-forest; leg. W. Rauh 52 827, June 1980; det. W. Rauh.
One sheet: inflorescence.
- Tillandsia buchlohii** Rauh, Trop. Subtrop. Pflanzenwelt 43: 11–13, Abb. 4, 1983.
HOLOTYPE: HEID, Paraguay, without locality; leg. M. Stellfeld s. n., BGH 33 518, received from SPI Wiesbaden; det. W. Rauh.
Eight sheets: (1) separated leaves, (2) leaf-rossette, (3 and 4) two leaves and inflorescence, (5–7) separated leaves and inflorescence, (8) inflorescence.
CLONOTYPE: HEID, flowered in the BGH and conserved in January 1983.
One sheet: separated leaves and inflorescence.
Cultivated in the BGH.
- Tillandsia carnosa** L.B. Smith
var. **brevistipitata** Rauh ex L.B. Smith and R.J. Downs, Flora Neotropica 14 (2): 904, 1977.
HOLOTYPE: HEID, Peru, Dept. Cajamarca, valley of the Río Utcubamba, 10 km east of Ingenio, Chota, 1,200 m, growing on cliffs; leg. W. Rauh 24 568, September 1970; det. W. Rauh.
Four sheets: (1–3) part of the inflorescence, (4) parts of the inflorescence.
ISOTYPE: US.
- var. **longispicata** Rauh ex L.B. Smith and R.J. Downs, Flora Neotropica 14 (2): 904, 1977.
HOLOTYPE: HEID, Peru, Dept. Cajamarca, valley of the Río Chamaya, near Pucara, 500 m, growing on cliffs; leg. W. Rauh 24 418, August 1970; det. W. Rauh.
Three sheets: (1–3) parts of the inflorescence.
ISOTYPE: US.
- Tillandsia chapeuensis** Rauh, Trop. Subtrop. Pflanzenwelt 58: 24–29, Abb. 15 and 16, 1986.
HOLOTYPE: HEID, Brasil, near the waterfall Morro de Chapeu, 800 m, growing terrestrially on sandstone rocks; leg. W. Rauh 56 545, July 1981; det. W. Rauh.
One sheet: separated leaves and inflorescence.
This species is close to *T. gardneri* Lindley.
- Tillandsia chiletensis** Rauh, Trop. Subtrop. Pflanzenwelt 50: 5–7, Abb. 1, 1984.
HOLOTYPE: HEID, Peru, Dept. Cajamarca, valley of Cajamarca, near Chilete, 2,000 m, growing epiphytically together with *T. cacticola* L.B. Smith; leg. W. Rauh 24 256a, August 1970; det. W. Rauh; flowered in the BGH and conserved in April 1984.
One sheet: whole plant with roots and inflorescence.
This species is close to *T. xiphioides* Ker-Gawler.
- Tillandsia churinensis** Rauh, Trop. Subtrop. Pflanzenwelt 53: 39–43, Abb. 21, 1985.
HOLOTYPE: HEID, Peru, Dept. Lima, valley of the Río Huaura, below Churin, 1,700 m, growing on steep rock-walls; leg. K. von Bismarck s. n., BGH 32 682, January 1979; det. W. Rauh and H. Lehmann.
One sheet: separated leaves and inflorescence.
NOTE: rev. W. Till (WU) 1989-11-17 (with a detailed inflorescence description in English).
This species is close to *T. latifolia* Meyen.
- Tillandsia clavigera** Mez var. **pendula** Rauh, Trop. Subtrop. Pflanzenwelt 52: 59–62, Abb. 36, 1985.
HOLOTYPE: HEID, Peru, Dept. Pasco, valley of Yaupi-Baja, 2,400 m, growing on steep rock-walls; leg. W. Rauh 63 924; det. W. Rauh.
Material in alcohol.
- Tillandsia cochabambae** Gross et Rauh, Die Bromelie 2/86: 14–15, 1 Abb., 1986.
HOLOTYPE: HEID, Bolivia, Dept. Cochabamba, valley of Cochabamba, 2,700 m, growing on rocks and forming dense clusters; leg. W. Rauh 40 609, August 1976; det. E. Gross and W. Rauh; flowered in the BGH and conserved in March 1986.
One sheet: whole plant with roots and inflorescence.
This species is close to *T. boliviensis* Baker.
Cultivated in the BGH.
- Tillandsia confinis** L.B. Smith var. **minor** J. Rutschmann et Rauh, Trop. Subtrop. Pflanzenwelt 65: 47–49, Abb. 29, “1988,” 1989.

HOLOTYPE: HEID, Ecuador, Prov. Loja, between Loja and Machala, 1,000 m, growing epiphytically on old coffee-trees; leg. J. Rutschmann s. n., BGH 68 537, September 1987; det. J. Rutschmann and W. Rauh.

One sheet: whole plant with inflorescence and one separated leaf.

Tillandsia copanensis Rauh et Rutschmann, J. Bromeliad Soc. 38(1): 7–9, Figs. 5, 6, 1988.

HOLOTYPE: HEID, Honduras, Prov. Copan, 20 km west of Santa Rosa de Copan, Cordillera del Merandon, growing epiphytically on *Pinus* and on cliffs; leg. E. Kamm s. n., BGH 68 087, June 1986; det. W. Rauh and J. Rutschmann.

One sheet: two leaves, parts of the inflorescence and separated flowers.

This species is close to *T. leucolepis* L. B. Smith and *T. chiapensis* C.S. Gardner.

Tillandsia denudata André var. **vivipara** Rauh, Trop. Subtrop. Pflanzenwelt 52: 63–65, Abb. 38, 1985.

HOLOTYPE: HEID, Peru, Dept. Amazonas, Marañon valley, between Celendin and Balsas, 2,700 m, growing terrestrially; leg. W. Rauh 40 030, July 1976; det. W. Rauh, flowered in the BGH and conserved in May 1984.

Five sheets: (1) two leaves, two offshoots and a single spike, (2) pieces of the scape longitudinally divided into halves and separated scape bracts, (3) basal part of the inflorescence, (4) central part of the inflorescence with offshoots, (5) apical part of the inflorescence with two offshoots.

Tillandsia dorotheae Rauh, Trop. Subtrop. Pflanzenwelt 60: 59–65, Abb. 40, 41 and 44, 1987.

HOLOTYPE: HEID, Argentina, Prov. Salta, near Jujuy, growing on cliffs; leg. D. Muhr s. n., BGH 31 306, 1972; det. W. Rauh.

One sheet: two plants with inflorescence.

NOTE: 31 306, Pflanze vielleicht identisch mit *T. walter-richteri*; abweichend: Blüten distich; Sepalen bis zum Grunde frei; Petalen karminrot, nicht blauviolett. Rauh, 12.2.86. (31 306, plant perhaps identical with *T. walter-richteri*; difference: flowers distich; sepals free; petals carmine-red not blue-violet. Rauh, 12.2.86).

This species is close to *T. argentina* C. H. Wright.

Tillandsia durangensis Rauh et R. Ehlers, Trop. Subtrop. Pflanzenwelt 41: 30–32, Abb. 13, 1983.

HOLOTYPE: HEID, Mexico, Estado Durango, 30 km north of Durango, 2,000 m, growing on steep limestone cliffs together with cacti; leg. R. Ehlers s. n., BGH 58 275, June 1982; det. W. Rauh and R. Ehlers; flowered in the BGH and conserved in August 1982.

Five sheets: (1) two leaves and a single spike, (2) separated scape bracts and inflorescence, (3–5) inflorescence.

This species is close to *T. polystachia* (L.) L. and *T. mazatlanensis* Rauh.

Tillandsia edithae Rauh, Trop. Subtrop. Pflanzenwelt 8: 19–21, Abb. 7, 1974.

HOLOTYPE: HEID, Bolivia, Dept. La Paz, Prov. Larecaja, Sorata, 2,700 m, growing on steep rock-walls; leg. W. Krahn K 295, in coll. A. Blass; det. W. Rauh.

One sheet: separated leaves and inflorescence longitudinally divided into halves.

NOTE: rev. C. A. Palací (RM), March 1993.

ISOTYPE: US.

This species is close to *T. nana* Baker.

Type locality wrong due to error (Till 1995).

Tillandsia ehlersiana Rauh, J. Bromeliad Soc. 34(4): 166–170, Figs. 8, 9, 1984.

HOLOTYPE: HEID, Mexico, Estado Chiapas, near Ocozocoautla, growing on steep granitic rocks in oak-forest; leg. R. and K. Ehlers 83/104, BGH 58 349; det. W. Rauh.

Material in alcohol.

This species is close to *T. seleriana* Mez.

Tillandsia elizabethae Rauh, Trop. Subtrop. Pflanzenwelt 31: 5–7, Abb. 1, 1979.

HOLOTYPE: HEID, Mexico, Estado Chihuahua, Barranca del Cobre, 1,200 m, growing epiphytically; leg. W. Rauh; det. W. Rauh.

One sheet: whole plant with inflorescence; material in alcohol.

Tillandsia elvirae-grossiae Rauh, Trop. Subtrop. Pflanzenwelt 65: 49–53, Abb. 30–33, "1988," 1989.

HOLOTYPE: HEID, Peru, Dept. Amazonas, near Ingenio, on the road to Pomacochas, 1,400 m, growing epiphytically in a gallery forest; leg. W. Rauh 38 332, August 1975; det. W. Rauh.

Eight sheets: (1 and 2) two leaves, (3) one leaf and one spike, (4) one leaf and branch of the inflorescence, (5) scape with the basal branch of the inflorescence, (5–8) branches of the inflorescence.

This species is close to *T. elongata* Humboldt, Bonpland and Kunth var. *subimbricata* (Baker) L.B. Smith.

- Tillandsia genseri** Rauh, Trop. Subtrop. Pflanzenwelt 65: 54–55, Abb. 34, “1988,” 1989.
HOLOTYPE: HEID, Argentina, Prov. Jujuy, near El Morillos Pocos, 1,800 m, growing on cliffs; leg. J. Genser s. n., BGH 68 790; det. W. Rauh.
Two sheets: (1) whole plant with inflorescence, (2) separated leaves and inflorescence.
This species is close to *T. argentina* C. H. Wright.
- Tillandsia glauca** L.B. Smith, Phytologia 20: 164, Figs. 6, 7, 1970.
ISOTYPE: HEID, Peru, Dept. Piura, near Ayabaca, 1,700–2,000 m; leg. W. Rauh 20 033, August 1967; det. L.B. Smith.
Four sheets: (1) scape with the lowest branches of the inflorescence, (2 and 3) parts of the inflorescence, (4) apical part of the inflorescence.
HOLOTYPE: US.
- Tillandsia guelzii** Rauh, Trop. Subtrop. Pflanzenwelt 65: 55–58, Abb. 35 and 36, “1988,” 1989.
HOLOTYPE: HEID, Argentina, probably Prov. Jujuy; leg. D. Muhr s. n., BGH 54 925; det. W. Rauh.
Four sheets: (1) separated leaves, (2–4) separated leaves and inflorescence.
This species is close to *T. vernicosa* Baker.
- Tillandsia guerreroensis** Rauh, Trop. Subtrop. Pflanzenwelt 60: 65–67, Abb. 45, 1987.
HOLOTYPE: HEID, Mexico, Estado Guerrero, between Acapulco and Zijuantanejo, 1,000 m, growing on rocks; leg. P. Koide s. n., BGH 66 721; det. W. Rauh.
One sheet: separated leaves and inflorescence.
This species is close to *T. schatzlii* Rauh.
- Tillandsia hammeri** Rauh et R. Ehlers, Trop. Subtrop. Pflanzenwelt 60: 67–69, Abb. 46, 1987.
HOLOTYPE: HEID, Mexico, between Oaxaca and Tehuacan, 2,500 m, growing on rocks; leg. G. Hammer s. n., BGH 66 719; det. W. Rauh and R. Ehlers.
One sheet: separated leaves, scape and inflorescence.
This species is close to *T. juncea* (Ruiz & Pavón) Poir.
- Tillandsia hauggiae** Rauh, Trop. Subtrop. Pflanzenwelt 52: 46–52, Abb. 28–30, 1985, as “*hauggii*.”
HOLOTYPE: HEID, Ecuador, Prov. Azuay, Cuenca-Giron, 2,700 m, growing epiphytically on trees at a riverside; leg. G. Haugg and R. Ehlers E 109, BGH 65 444; det. W. Rauh.
One sheet: one leaf and inflorescence.
Currently named *Racinaea hauggiae* (Rauh) J.R. Grant (Grant 1993a).
This species is close to *R. undulifolia* (Mez) Luther (Luther 1994).
- Tillandsia hemkeri** Rauh, Trop. Subtrop. Pflanzenwelt 16: 28–30, Abb. 14, 1976.
HOLOTYPE: HEID, Ecuador, Prov. Pastaza, between Puyo and Baños, near Shell Mera, 1,000 m, epiphytic; leg. Hemker s. n., BGH 35 901; det. W. Rauh.
One sheet: separated leaves and inflorescence.
- Tillandsia hildae** Rauh, Trop. Subtrop. Pflanzenwelt 3: 19–25, Abb. 9–13, 1973.
HOLOTYPE: HEID, Peru, Dept. Cajamarca, Chamaya-valley, 800–1,100 m, growing on steep rock-walls; leg. W. Rauh 24 319, September 1970; det. W. Rauh.
Seventeen sheets: (1 and 2) one leaf, (3) two leaves, (4) piece of the scape, (5) pieces of the scape, (6–17) part of the inflorescence; material in alcohol.
This species is close to *T. platyphylla* Mez.
Cultivated in the BGH.
- Tillandsia hirtzii** Rauh, Trop. Subtrop. Pflanzenwelt 18: 12–17, Abb. 5–5b, 1976.
HOLOTYPE: HEID, Ecuador, Prov. Napo, valley of Baeza, near Baeza, 1,900 m, growing epiphytically in mountain-forest; leg. W. Rauh 37 545; det. W. Rauh.
Five sheets: (1) one leaf and one branch of the inflorescence, (2) basal part of the inflorescence, (3–5) two branches of the inflorescence; material in alcohol.
- Tillandsia hondurensis** Rauh, Trop. Subtrop. Pflanzenwelt 33: 5–7, Abb. 1, 1981.
HOLOTYPE: HEID, Honduras, Dept. Francisco Morazan, Valle de Angel, near Tegucigalpa, 1,800 m, growing on steep rock-walls; leg. E. Kamm and W. Rauh 44 149, November 1977; det. W. Rauh; flowered in the BGH and conserved in July 1980.
One sheet: whole plant with inflorescence.
- Tillandsia horstii** Rauh, Trop. Subtrop. Pflanzenwelt 27: 5–8, Abb. 1 and 2, 1979.
HOLOTYPE: HEID, Brasil, Estado Minas Gerais, near Moro de Chapeu; leg. L. Horst s. n., BGH 31 079, September 1972; det. W. Rauh.

One sheet: separated leaves and inflorescence.

Tillandsia jucunda Castellanos var. **viridiflora** Rauh, Trop. Subtrop. Pflanzenwelt 31: 13–14, Abb. 6, 1979.

HOLOTYPE: HEID, Bolivia, locality not known; leg. W. Rausch 54, BGH 31 614; det. W. Rauh.

Three sheets: (1) one leaf and inflorescence, (2 and 3) separated leaves and inflorescence.

Cultivated in the BGH.

Tillandsia juerg-rutschmannii Rauh, Trop. Subtrop. Pflanzenwelt 52: 54–56, Abb. 34, 1985.

HOLOTYPE: HEID, Mexico, Estado Chiapas, canyon of the Río Grijalva, 1,000 m, growing on steep limestone rocks; leg. J. Rutschmann s. n., BGH 65 452, December 1983; det. W. Rauh.

One sheet: inflorescence.

This species is close to *T. superinsignis* Matuda.

Tillandsia kirschnekii Rauh et W. Till, Trop. Subtrop. Pflanzenwelt 43: 13–15, Abb. 6 and 7, 1983.

HOLOTYPE: HEID, Peru, Dept. Apurimac, between Abancay and Andahuaylas, at the bridge over the Río Pachachaca, 2,500 m, growing on rock-walls; leg. E. Kirschnek s. n., BGH 39 770, 1977; det. W. Rauh.

One sheet: whole plant with roots and inflorescence.

This species is close to *T. streptocarpa* Baker.

Tillandsia koideae Rauh and E. Gross, Trop. Subtrop. Pflanzenwelt 79: 19–22, Abb. 9, 1991.

HOLOTYPE: HEID, Peru, Dept. Piura, between Canchaque and Huancabamba, 2,800 m, growing terrestrially; leg. P. Koide s. n., BGH 91 975; det. W. Rauh and E. Gross.

Three sheets: (1) three leaves, (2) scape, (3) infructescence (without seeds); material in alcohol.

This species is close to *T. denudata* André.

Tillandsia krahni Rauh, Trop. Subtrop. Pflanzenwelt 33: 9–11, Abb. 3 and 3a, 1981.

HOLOTYPE: HEID, Peru, Dept. Ancash, 17 km north of San Luis, near Luzuriaga at the Río Ashnucancha, 2,300 m, growing on rocks; leg. W. Krahn 595, BGH 50 881, June 1979; det. W. Rauh.

One sheet: two leaves and two inflorescences.

Cultivated in the BGH.

Tillandsia krukoffiana L.B. Smith var. **piepenbringii** Rauh, J. Bromeliad Soc. 36(6): 258–263 and 272–273, Figs. 10–12, 1986.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, Carhuaquero-Llama, east of Chiclayo, 500–800 m, growing on rocks together with *T. teres* L.B. Smith; leg. W. Rauh 35 343, July 1973; det. W. Rauh.

Eight sheets: (1 and 2) one leaf, (3) separated scape bracts and part of the inflorescence, (4) one scape bract and parts of the inflorescence, (5–8) part of the inflorescence.

Tillandsia kurt-horstii Rauh, Trop. Subtrop. Pflanzenwelt 60: 69–77, Abb. 47–51 and 53, 1987.

HOLOTYPE: HEID, Brasil, Estado Minas Gerais, south of Vitoria da Conquista, near Pedra Azul, 1,000 m, growing on an inselberg and there forming loose mats; leg. W. Rauh and L. Horst 67 335, April 1986; det. W. Rauh.

Six sheets: (1) whole plant with roots and single inflorescence, (2) separated plants, one with inflorescence, (3) separated plants with roots, two with inflorescence, (4–6) plant groups with roots; material in alcohol.

This species is close to *T. streptocarpa* Baker.

Cultivated in the BGH.

Tillandsia latifolia Meyen var. **leucophylla** Rauh, Trop. Subtrop. Pflanzenwelt 13: 21–26, Abb. 10–12, 1974.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, Río Chancay, 600–800 m, growing on rocks; leg. W. Rauh 35 340, October 1973; det. W. Rauh.

Five sheets: (1) three leaves, (2) whole plant with roots and inflorescence, (3) scape with inflorescence, (4) separated leaves and two inflorescences, (5) two photos black and white, 13×18 cm, showing the habit of the plant at the locality.

Tillandsia lehmannii Rauh, Trop. Subtrop. Pflanzenwelt 8: 15–19, Abb. 5–6a, 1974.

HOLOTYPE: HEID, Ecuador, Macara, 500 m, growing in a *Ceiba pentandra* forest; leg. W. Rauh 24 195, July 1970; det. W. Rauh.

Three sheets: (1) two leaves and scape with inflorescence, (2) separated leaves and inflorescence, (3) two leaves and inflorescence.

Synonym of *T. flagellata* L.B. Smith.

Tillandsia lotteae H. Hromadnik, J. Bromeliad Soc. 28(6):263–265, 2 Figs., 1978.

HOLOTYPE: HEID (missing).

TOPOTYPE: HEID, Bolivia, Dept. Chusquisaca, Sucre-Cochabamba, 1,700 m; leg. H. and L. Hromadnik s. n., BGH 50 788, August 1979; det. H. Hromadnik.

One sheet: separated leaves and two inflorescences.

NOTE: rev. C. A. Palací (RM), March 1993.

Tillandsia lymanii Rauh, Trop. Subtrop. Pflanzenwelt 13: 16–21, Abb. 7–9, 1974.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, Río Chancay, along the road to Sta. Cruz, 600–800 m, growing on rock-walls; leg. W. Rauh 35 345, October 1973; det. W. Rauh.

Six sheets: (1) one leaf, (2) separated leaves, (3) one leaf and separated branches of the inflorescence, (4) scape with the basal part of the inflorescence, (5) inflorescence, (6) two photos black and white, 13×18 cm, showing the plant at the locality and in culture (BGH); material in alcohol.

Cultivated in the BGH.

Tillandsia macbrideana L.B. Smith

var. **atroviolacea** Rauh, Trop. Subtrop. Pflanzenwelt 53: 37–39, Abb. 19–21, 1985.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, above Leimebamba, 2,700 m, growing on steep limestone cliffs; leg. W. Rauh 53 856a, July 1980; det. W. Rauh.

One sheet: whole plant with offshoot, roots and inflorescence and plant with inflorescence.

NOTE: rev. W. Till (WU), 1989-11-16. (With a detailed diagnosis of the inflorescence in English.)

var. **longifolia** Rauh, Trop. Subtrop. Pflanzenwelt 53: 35, Abb. 17, 1985.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, 25 km east of Cajamarca towards Cajamarca, 2,500 m, growing on steep cliffs; leg. W. Rauh 53 775, July 1980; det. W. Rauh.

One sheet: whole plant with roots and inflorescence.

NOTE: rev. W. Till (WU), 1989-11-16. (With a detailed diagnosis of the inflorescence in English.)

var. **longispica** Rauh, Trop. Subtrop. Pflanzenwelt 53: 35–37, Abb. 18, 1985.

HOLOTYPE: HEID, Peru, Dept. La Libertad, between Otusco and La Libertad, 3,000 m, growing on steep cliffs; leg. W. Rauh 35 537, October 1973; det. W. Rauh.

One sheet: three whole plants with roots and inflorescence.

NOTE: rev. W. Till (WU), 1989-11-16.

(With a detailed diagnosis of the inflorescence in English.)

var. **major** Rauh, Trop. Subtrop. Pflanzenwelt 53: 35, Abb. 15 and 16, 1985.

HOLOTYPE: HEID, Peru, Dept. La Libertad, Huamachuco, 2,700 m, growing on the inca-ruins; leg. W. Rauh 53 778, July 1980; det. W. Rauh.

One sheet: whole plant with roots and inflorescence.

NOTE: rev. W. Till (WU), 1989-11-16. (With a detailed diagnosis of the flowers in English.)

Tillandsia marcalaensis Rauh et E. Gross, Trop. Subtrop. Pflanzenwelt 79: 22–25, Abb. 11, 1991.

HOLOTYPE: HEID, Honduras, near Marcala, 1,600 m, growing in degraded mountain-forest; leg. W. Rauh 70 961, December 1989; det. W. Rauh and E. Gross; flowered in the BGH and conserved in July 1990.

Two sheets: (1) one leaf and two scape bracts, (2) inflorescence.

Tillandsia marconae W. Till and E. Vitek, Pl. Syst. Evol. 149: 143–147, Abb. 1, 1985.

ISOTYPE: HEID, Peru, Dept. Ica, Prov. Nazca, Lomas de Marcona, along the road to Campamento de Belvedere, 600–800 m; leg. W. Till and E. Vitek 820825/137 (=WT 234-1), August 1982; det. W. Till.

One sheet: separated whole plants with roots, one with inflorescence.

NOTE: Geschenk an HEID, W. Till, 1986-06-30. (Gift to HEID, W. Till, 1986-06-30.)

HOLOTYPE: WU.

This species is close to *T. paleacea* Presl and *T. purpurea* Ruiz and Pavón.

Tillandsia marnier-lapostollei Rauh, Trop. Subtrop. Pflanzenwelt 3: 6–10, Abb. 1–3, 1973.

HOLOTYPE: HEID, Ecuador, Prov. Loja, Macara, 500 m, growing on dry cliffs; leg. W. Rauh 24 188, August 1970; det. W. Rauh.

Seven sheets: (1 and 2) one leaf, (3) piece of the scape and parts of the inflorescence, (4–7) part of the inflorescence; material in alcohol.

ISOTYPE: US.

This species is close to *T. cucullata* L.B. Smith.

Tillandsia mazatlanensis Rauh, Trop. Subtrop. Pflanzenwelt 33: 7–9, Abb. 2, 1981.

HOLOTYPE: HEID, Mexico, Estado Sinoloa, near Mazatlan, 50 m, growing in a

dry forest; leg. W. Rauh 50 441, June 1979; det. W. Rauh.

Two sheets: (1) two leaves and bipinnate inflorescence, (2) one leaf and one leaf-sheath and simple inflorescence.

Tillandsia mima L.B. Smith var. **chiletensis** Rauh, Trop. Subtrop. Pflanzenwelt 21: 21–28, Abb. 13 and 14, 1977.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, Río Jequetepeque, between Chilote and Templadera, 800 m, growing terrestrially; leg. W. Rauh 40 007, July 1976; det. W. Rauh.

Three sheets: (1) two leaves and scape with the basal part of the infructescence with seeds, (2 and 3) one leaf and part of the infructescence with seeds.

Tillandsia muhriæ Rauh, Die Bromelie 1/86: 1–2, Abb. 1, 2 and front cover, 1986, as “*muhrii*.”

HOLOTYPE: HEID, Argentina, Prov. Jujuy, locality not known; leg. D. Muhr T8a, BGH 31 839, May 1973; det. W. Rauh.

One sheet: separated leaves and inflorescence.

NOTE: *Tillandsia zecheri* W. Till var. *cafayatisensis* C. Palací; det. C. Palací, RM, Jan. 1993.

Currently named *T. zecheri* W. Till var. *cafayatisensis* C. Palací and G. Brown (Palací & Brown 1994).

Tillandsia nidus Rauh et Lehmann, Trop. Subtrop. Pflanzenwelt 41: 19–22, Abb. 8, 1983.

HOLOTYPE: HEID, Mexico, without locality; leg. J. Rutschmann s. n., BGH 46 409, 1969; det. W. Rauh and H. Lehmann; flowered in the BGH and conserved in March 1976.

One sheet: two leaves and inflorescence, longitudinally divided into halves.

Currently named *T. × nidus* Rauh et Lehmann (= *T. fasciculata* Swartz × *T. ionantha* Planchon).

Tillandsia oroyensis Mez var. **secundiflora** Rauh, Trop. Subtrop. Pflanzenwelt 21: 16–21, Abb. 9, 1977.

HOLOTYPE: HEID, Peru, Dept. Ancash, near Chavin, 3,400 m, growing on dry cliffs; leg. W. Rauh 40 402, July 1976; det. W. Rauh.

Two sheets: (1) three leaves, (2) two leaves and inflorescence.

Tillandsia oxapampæ Rauh et von Bismarck, Trop. Subtrop. Pflanzenwelt 53: 20–26, Abb. 9 and 10, 1985.

HOLOTYPE: HEID, Peru, Dept. Pasco,

near Oxapampa, 1,900 m, epiphytic; leg. W. Rauh and K. von Bismarck 66 069, October 1984; det. W. Rauh.

Four sheets: (1) one leaf, (2) two leaves, (3) part of the inflorescence, (4) parts of the inflorescence.

This species is close to *T. macrodactylon* Mez.

Tillandsia pamelæ Rauh, J. Bromeliad Soc. 36(3): 117–118 and 125; Fig. 6, 1986.

HOLOTYPE: HEID, Mexico, Estado Jalisco, Ayutla, near the road to Talpar de Alende, 1,800 m, growing on rocks; leg. P. Koide s. n., BGH 66 869, May 1984; det. W. Rauh; flowered in the BGH and conserved in June 1987.

Five sheets: (1) one leaf, (2 and 3) two leaves, (4 and 5) inflorescence.

Tillandsia pampasensis Rauh, Trop. Subtrop. Pflanzenwelt 43: 5–9, Abb. 1, 1983.

HOLOTYPE: HEID, Peru, Dept. Huancaavelica, Mantaro-valley, near Pampas, 2,700 m, growing epiphytically; leg. W. Rauh 25 913, August 1971; det. W. Rauh.

Three sheets: (1) whole plant with inflorescence [NOTE: sepal acuta, peralaxe lepidota, 15 mm longa, anteriora libera, posteriora breviter (2mm) connata, carinata], (2) whole plant with inflorescence, (3) separated leaves and two inflorescences [NOTE: bracteae florigerae 18, 5–20 mm longae, extus dense lepidotae, acutae, ±ecarinatae, intus subglabrae squamis perpaucis; sepala laxe lepidota, acuta, 14–15 mm longa, anteriora ecarinata, sublibera, nervata, posteriora carinata, 2 mm connata, tota margine scariosa]; material in alcohol.

This species is close to *T. nana* Baker.

Tillandsia peiranoi Castellanos var. **alba** J. Rutschmann, Trop. Subtrop. Pflanzenwelt 58: 32–35, Abb. 20 and 20a, 1986.

HOLOTYPE: HEID, Argentina, Prov. Salta, Rio Pasaje, 7 km below Cabra Corall, 800–900 m, growing on rocks; leg. J. Rutschmann 85/1, BGH 65 933, May 1985; det. J. Rutschmann.

Three sheets: (1–3) separated leaves and inflorescence.

Tillandsia pentasticha Rauh et R. Wülfinghoff, Trop. Subtrop. Pflanzenwelt 65: 59–61, Abb. 37 and 38, 1988.

HOLOTYPE: HEID, Mexico, Estado Guerrero, near Tlapa, growing epiphytically; leg. R. Wülfinghoff T.87/137, BGH 68 798, September 1987; det. W. Rauh.

One sheet: whole plant with roots and inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved in April 1988.

One sheet: separated leaves and inflorescence.

This species is close to *T. nolleriana* R. Ehlers.

Tillandsia pfeufferi Rauh, Trop. Subtrop. Pflanzenwelt 65: 61–63, Abb. 39, "1988," 1989.

HOLOTYPE: HEID, Argentina, Prov. Jujuy, near Entre Rios, 1,800 m, growing on rock-walls together with *T. didisticha* (Morrén) Baker; leg. D. Muhr s. n., BGH 68 820; det. W. Rauh.

Two sheets: (1) whole plant with inflorescence, (2) leaf-rossette longitudinally divided into halves, one half with inflorescence.

This species is close to *T. lorentziana* Grisebach.

Tillandsia pfisteri Rauh, Trop. Subtrop. Pflanzenwelt 50: 7–10, Abb. 2 and 2a, 1984.

HOLOTYPE: HEID, Brasil, Estado Pernambuco, near Jaquatinga do Norte, 900 m, growing on rock-walls; leg. G. Pfister 7183, BGH 59 628; det. W. Rauh.

Two sheets: (1) separated leaves, (2) scape with inflorescence.

This species is close to *T. polystachia* (L.) L.

Tillandsia platyrhachis Mez

var. **alba** Rauh et Hirtz, Trop. Subtrop. Pflanzenwelt 53: 11–17 (20), Abb. 6 and 7, 1985.

HOLOTYPE: HEID, Ecuador, Prov. Napo, between Baeza and Lago Agrio, near the waterfall of the Río Coca, 1,400 m, growing epiphytically in mountain-forest; leg. W. Rauh 37 571, August 1975; det. W. Rauh and A. Hirtz; flowered in the BGH and conserved in February 1985.

Six sheets: (1 and 2) separated leaves, (3) inflorescence, (4–6) parts of the infructescence; material in alcohol.

var. **magnifica** Rauh et von Bismarck, Trop. Subtrop. Pflanzenwelt 53: 6–11, Abb. 2–5, 1985.

HOLOTYPE: HEID, Peru, Dept. Huanuco, Tingo Maria-Pucallpa, below Abra Pucara, 1,900 m, growing epiphytically in cloud-forest; leg. W. Rauh and K. von Bismarck 66 107, October 1984; det. W. Rauh.

Three sheets: (1 and 2) one leaf, (3) two branches of the inflorescence; material in alcohol.

Tillandsia pomacocha Rauh, Trop. Subtrop. Pflanzenwelt 3: 25–29, Abb. 14 and 15, 1973.

HOLOTYPE: HEID, Peru, Dept. Caji-

marca, near Ingenio, above Pomacocha, 2,100 m, growing terrestrially in a moss-rich mountain-forest; leg. W. Rauh 24 554, August 1970; det. W. Rauh.

Six sheets: (1) one leaf, (2) two leaves, (3) scape and basal part of the inflorescence, (4) part of the inflorescence, (5 and 6) one leaf and part of the inflorescence.

This species is close to *T. pyramidata* André.

Tillandsia portillae E. Gross and R. Wülfinhoff, J. Bromeliad Soc. 47(2): 52–53, Fig. 1 and front cover, 1997.

HOLOTYPE: HEID, Ecuador, Prov. Loja, 2,800 m; leg. R. Wülfinhoff 93/471, det. E. Gross.

One sheet: two leaves; inflorescence in alcohol.

This species is close to *T. porphyrocraspeda* J.R. Grant (syn. *Vriesea cylindrica* L.B. Smith).

Tillandsia propagulifera Rauh, Trop. Subtrop. Pflanzenwelt 3: 10–15, Abb. 4–6, 1973.

HOLOTYPE: HEID, Peru, Dept. La Libertad, near Milagro, shore of the Río Utubamba, 450 m, growing epiphytically on *Prosopis* trees; leg. W. Rauh 24 346, August 1970; det. W. Rauh.

Eighteen sheets: (1) two leaves, (2 and 3) leaf-rossette of an offshoot longitudinally divided into halves, (4) two offshoots, (5) one leaf, two offshoots and seeds, (6) separated offshoots, inflorescence with offshoots, (7–10) parts of the inflorescence, partly with fruits that contain seeds, (11–14) parts of the inflorescence, partly with fruits that contain seeds and offshoot, (15) part of the inflorescence with offshoots and empty fruits, (16 and 17) parts of the inflorescence with fruits that contain seeds, separated seeds and one offshoot, (18) piece of the scape and parts of the inflorescence in postfloral condition; material in alcohol.

This species is close to *T. paniculata* L. and *T. utriculata* L..

Tillandsia pseudomacbrideana Rauh, Trop. Subtrop. Pflanzenwelt 53: 26–29, Abb. 12, 1985.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, Lagoon Saurococha, 2,800 m, growing on steep rock-walls; leg. W. Rauh 53 774, July 1980; det. W. Rauh; flowered in the BGH and conserved in February 1985.

Two sheets: (1) one leaf, inflorescence and single flower [NOTE: rev. W. Till (WU), 1989-11-17 (with a detailed description of the inflorescence in English)], (2)

whole plant with inflorescence and single spike [NOTE: rev. C.A. Palací (RM), March 1993].

This species is close to *T. macbrideana* L.B. Smith.

Cultivated in the BGH.

Tillandsia pseudomicans Rauh, Trop. Subtrop. Pflanzenwelt 12: 21–27, Abb. 12, 13 and 15, 1974.

HOLOTYPE: HEID, Peru, Dept. Apurímac, valley of the Río Apurímac, between Andahuaylas and Abancay, 2,200 m, growing on steep limestone cliffs; leg. W. Rauh 25 945, August 1971; det. W. Rauh.

Two sheets: (1) leaf-rosette with roots, longitudinally divided into halves, (2) separated leaves and inflorescence; material in alcohol.

This species is close to *T. micans* L.B. Smith.

Tillandsia pseudosetacea R. Ehlers et Rauh, Trop. Subtrop. Pflanzenwelt 58: 35–37, Abb. 21, 1986.

HOLOTYPE: HEID, Mexico, Estado Oaxaca, between Puerto Escondido and Oaxaca, 1,800 m, growing epiphytically in pine-oak-forest; leg. R. Ehlers EM 82015, March 1982; det. R. Ehlers and W. Rauh.

One sheet: three flowering plants with offshoots and three separated inflorescences.

This species is close to *T. setacea* Swartz.

Tillandsia purpurascens Rauh, Trop. Subtrop. Pflanzenwelt 75: 34–37, Abb. 18, 1990.

HOLOTYPE: HEID, Peru, Dept. Piura, Huancabamba-Canchaque, 3,000 m, growing epiphytically in mountain-forest; leg. W. Rauh 69 427a, February 1988; det. W. Rauh.

One sheet: scape, separated bracts and inflorescence.

This species is close to *T. restrepoana* André.

Tillandsia pyramidata André var. **vivipara** Rauh, Trop. Subtrop. Pflanzenwelt 3: 17–19, Abb. 7 and 8, 1973.

HOLOTYPE: HEID, Peru, Tarma, 2,600 m, growing on rocks and terrestrial; leg. W. Rauh 23 686a, July 1970; det. W. Rauh.

Two sheets: (1) three leaves, two of it without tips, (2) inflorescence.

Tillandsia rauhii L.B. Smith var. **longispica** Rauh, Trop. Subtrop. Pflanzenwelt 75: 37–42, Abb. 19 and 20, 1990.

HOLOTYPE: HEID, Peru, Dept. Lam-

bayeque, valley of the Río Chancay, east of Chiclayo, 700 m, growing on steep rock-walls; leg. W. Rauh 69 431, February 1988; det. W. Rauh.

Five sheets: (1–4) part of the inflorescence, (5) piece of the scape.

Tillandsia rauschii Rauh et Lehmann, Trop. Subtrop. Pflanzenwelt 21: 41–45, Abb. 24, 1977.

HOLOTYPE: HEID, Bolivia, without locality; leg. W. Rausch s. n., BGH 31 623, March 1973; det. W. Rauh; flowered in the BGH and conserved in April 1983.

One sheet: separated leaves and inflorescence.

This species is close to *T. jucunda* Castellanos.

Cultivated in the BGH.

Tillandsia reducta L.B. Smith, Phytologia 5: 399, Figs. 11, 12, 1956.

ISOTYPES: USM; HEID, Peru, Dept. Cajamarca, km 12–13 Cajamarca-Cajabamba, 2,500–2,600 m; leg. R. Ferreyra 3216, March 1948; det. L.B. Smith.

One sheet: three plants with inflorescence.

HOLOTYPE: US.

Tillandsia roetingii Rauh, Trop. Subtrop. Pflanzenwelt 21: 11–16, Abb. 4–6b, 1977.

HOLOTYPE: HEID, Peru, Dept. Amazonas, Río Sonche, along the road from Chachapoyas to Mendoza, km 550, 2,400 m, growing epiphytically; leg. W. Rauh 40 105, July 1976; det. W. Rauh.

Five sheets: (1) one leaf and part of the inflorescence, (2) one leaf, piece of the scape and apical part of the inflorescence, (3 and 4) parts of the inflorescence, (5) part of the inflorescence.

CLONOTYPE: HEID, flowered in the BGH and conserved without date.

Four sheets: (1) piece of the scape with leaves, (2) piece of the scape and parts of the inflorescence, (3) basal parts of the inflorescence, (4) parts of the inflorescence.

ISOTYPE: US.

Tillandsia romeroi L.B. Smith var. **gruberi** Rauh, Trop. Subtrop. Pflanzenwelt 60: 77–82, Abb. 54 and 55, 1987.

HOLOTYPE: HEID, Colombia, between Duitama and Charalá, near Bogotacito, 1,800–2,000 m, growing epiphytically in low bushes; leg. F.G. Gruber s. n., BGH 55 154, April 1987; det. W. Rauh.

Two sheets: (1) one leaf and bipinnate inflorescence, (2) two leaves and simple inflorescence and single flower.

Tillandsia rothii Rauh, Trop. Subtrop. Pflanzenwelt 16: 30–36, Abb. 15 and 16, 1976.

HOLOTYPE: HEID, Mexico, Estado Guerrero, 70 miles north of Manzanilla, 50 m, growing in coastal-forest; leg. J. M. Roth s. n., BGH 32 693, October 1974; det. W. Rauh.

Two sheets: (1 and 2) separated leaves and inflorescence; material in alcohol.

This species is close to *T. intumescens* L.B. Smith.

Tillandsia rubro-violacea Rauh, Trop. Subtrop. Pflanzenwelt 27: 10–13, Abb. 4, 1979.

HOLOTYPE: HEID, Ecuador, Prov. Loja, near Vilcabamba, 1,300 m, growing on dry rocks; leg. W. Rauh 38 323a, 1976; det. W. Rauh.

Three sheets: (1) separated leaves, (2) scape and inflorescence, (3) one leaf and inflorescence and a detailed description of the flower in latin; material in alcohol.

This species is close to *T. reuteri* Rauh.

Tillandsia schatzlii Rauh, Trop. Subtrop. Pflanzenwelt 27: 8–10, Abb. 3, 1979.

HOLOTYPE: HEID, Mexico, Estado Oaxaca, between Oaxaca and Tehuacan, growing on cliffs; leg. S. Schatzl s. n., BGH 46 304; det. W. Rauh.

One sheet: separated leaves and inflorescence.

This species is close to *T. califani* Rauh.

Tillandsia schusteri Rauh, Trop. Subtrop. Pflanzenwelt 58: 37–41, Abb. 22 and 22a, 1986.

HOLOTYPE: HEID, Mexico, Estado Oaxaca, near Nacaltepec, 1,300–1,500 m, growing on steep cliffs; leg. W. Schuster s. n., BGH 66 720, February 1986; det. W. Rauh.

Two sheets: (1 and 2) separated leaves and inflorescence.

This species is close to *T. dugesii* Baker and *T. rodrigueziana* Mez.

Tillandsia secunda Humboldt, Bonpland and Kunth

var. **major** Rauh, Trop. Subtrop. Pflanzenwelt 21: 28–34, Abb. 15 and 16, 1977; latin diagnosis 50: 36, 1984.

HOLOTYPE: HEID, Ecuador, Prov. Cuenca, near Oña, 2,100 m, growing on dry rocks; leg. W. Rauh 35 085, September 1973; det. W. Rauh.

One sheet: one leaf and spike of the inflorescence.

var. **vivipara** Rauh, Trop. Subtrop. Pflanzenwelt 21: 28–34, Abb. 17, 1977; latin diagnosis 50: 36, 1984.

HOLOTYPE: HEID, Ecuador, Prov. Pi-

chinchá, Cuallabamba, 2,800 m, growing on dry rocks; leg. W. Rauh 34 001, July 1973; det. W. Rauh.

Two sheets: (1) parts of the inflorescence, (2) parts of the inflorescence with offshoots, in the basal part fruiting.

Tillandsia spiralliflora Rauh, Trop. Subtrop. Pflanzenwelt 18: 8–12, Abb. 3 and 4, 1976.

HOLOTYPE: HEID, Peru, Dept. Cajamarca, Marañón valley, above of Balsas towards Leimebamba, 1,500 m, growing on sandstone-rocks; leg. W. Rauh 38 567, August 1975; det. W. Rauh.

Five sheets: (1) one leaf, (2) one leaf and part of the inflorescence, (3) piece of the scape and parts of the inflorescence, (4) piece of the scape and part of the inflorescence, (5) parts of the inflorescence; material in alcohol.

Tillandsia streptocarpa Baker var. **aureiflora** Rauh, Trop. Subtrop. Pflanzenwelt 50: 14–16, Abb. 5, 1984.

HOLOTYPE: HEID, Bolivia, near Cochabamba, 1,200 m, growing in a dry forest; leg. A. Lau T68, BGH 31 947, April 1976; det. W. Rauh.

Two sheets: (1 and 2) separated leaves and inflorescence.

Tillandsia stricta Solander var. **albifolia** H. Hromadnik et Rauh, Trop. Subtrop. Pflanzenwelt 41: 28–29, Abb. 12, 1983.

HOLOTYPE: HEID, Brasil, Estado Espírito Santo, between Alegre and Jeronimo Monteiro, growing epiphytically on trees; leg. H. and L. Hromadnik HR 6135, BGH 54 990; det. H. Hromadnik and W. Rauh.

One sheet: separated leaves and inflorescence.

Tillandsia toropiensis Rauh, Trop. Subtrop. Pflanzenwelt 50: 10–13, Abb. 3 and 4, 1984.

HOLOTYPE: HEID, Brasil, Estado Rio Grande do Sul, at the river Toropi, 300 m, growing terrestrially between rocks; leg. W. Rauh 56 059, September 1981; det. W. Rauh.

One sheet: separated leaves, inflorescence without flowers, single flower.

Cultivated in the BGH.

Tillandsia vernardoi Rauh, Trop. Subtrop. Pflanzenwelt 16: 36–38, Abb. 19a and 19b, 1976.

HOLOTYPE: HEID, Mexico, Estado Oaxaca, between Oaxaca and Mitla, 2,000 m; leg. J. Roth and V. Magnuson s. n., BGH 32 686, 1974; det. W. Rauh.

One sheet: separated leaves, scape bracts and inflorescence.

Tillandsia vicentina Standley var. **wuelfinghoffii** E. Gross, Trop. Subtrop. Pflanzenwelt 60: 82–85, Abb. 56, 58 and 59, 1987.

HOLOTYPE: HEID, Mexico, Estado Chiapas, road from San Cristobal to Comitán, 2,000–2,200 m; leg. R. Wülfinghoff s. n., BGH 68 029; det. E. Gross.

One sheet: separated leaves, scape bracts, and inflorescence.

Vriesea albo-rubrobracteata Rauh, Trop. Subtrop. Pflanzenwelt 16: 19–22, Abb. 10, 1976.

HOLOTYPE: HEID, Peru, Dept. Amazonas, between Nazareth and Milagro, 800 m, growing epiphytically in rain-forest; leg. A. Lau s. n., BGH 17 453, June 1968; det. W. Rauh; flowered in the BGH and conserved in November 1971.

One sheet: two leaves and inflorescence. This species is close to *V. subandina* (Ule) L.B. Smith and Pittendrigh.

Vriesea andreettae Rauh, Trop. Subtrop. Pflanzenwelt 43: 22–28, Abb. 13 and 14, 1983.

HOLOTYPE: HEID, Ecuador, Prov. Azuay, along the road Sta. Isabel-Pasaje, growing on rocks; leg. W. Rauh 38 140, July/August 1975; det. W. Rauh; flowered in the BGH and conserved in May 1982.

Three sheets: (1) whole plant with roots and inflorescence, (2) separated leaves and inflorescence, (3) one leaf and inflorescence.

Cultivated in the BGH.

TOPOTYPE: HEID; leg. W. Rauh 52 972, June 1980; det. W. Rauh.

Two sheets: (1) separated leaves, (2) separated scape bracts and inflorescence.

TOPOTYPE: HEID; leg. W. Rauh 52 975, June 1980; det. W. Rauh.

Two sheets: (1) separated leaves, (2) one leaf, separated scape bracts and two inflorescences.

Currently named *Tillandsia andreettae* (Rauh) J.R. Grant (Grant 1993b).

Vriesea atrococcinea Rauh, Trop. Subtrop. Pflanzenwelt 33: 14–17, Abb. 5, 1981.

HOLOTYPE: HEID, Brasil, without locality; received from B.G. Berlin No. 24, BGH 50 887; det. W. Rauh.

Absent for loan.

This species is close to *V. bleheri* Roeth.

Vriesea curvispica Rauh, Trop. Subtrop. Pflanzenwelt 42: 21–24, Abb. 13, 1983.

HOLOTYPE: HEID, Peru, Dept. Ama-

zonas, Río Marañon, above of Balsas, 1,200 m, growing on sandstone rocks; leg. W. Rauh 52 835, May 1980; det. W. Rauh; flowered in the BGH and conserved in October 1982.

One sheet: two pieces of leaves, separated scape bracts, and inflorescence.

Currently named *Tillandsia curvispica* (Rauh) J.R. Grant (Grant 1993b).

Vriesea dressleri Rauh, Trop. Subtrop. Pflanzenwelt 58: 41–44, Abb. 23 and 24, 1986.

HOLOTYPE: HEID, Panama, Prov. Code, San Anton del Valle, 800 m, growing terrestrially in mountain-forest; leg. R. Dressler s. n., BGH 48 646; det. W. Rauh.

One sheet: two leaves and inflorescence; material in alcohol.

Currently named *Werauhia dressleri* (Rauh) J.R. Grant (Grant 1995a)

This species is close to *Werauhia patzeltii* (Rauh) J.R. Grant.

Vriesea limonensis Rauh, Trop. Subtrop. Pflanzenwelt 43: 19–22, Abb. 11, 1983.

HOLOTYPE: HEID, Ecuador, Prov. Azuay, between Paute and Mendez, near Limón, 1,000 m, growing epiphytically in mountain-forest; leg. W. Rauh 53 092, June 1980; det. W. Rauh.

One sheet: one leaf and inflorescence.

Currently named *Tillandsia limonensis* (Rauh) J.R. Grant (Grant 1993b).

Vriesea malzinei E. Morren var. **disticha** L.B. Smith, Phytologia 22: 87, Fig. 8, 1971.

ISOTYPE: HEID, Mexico, Estado Chiapas, Mal Paso Highway, north of Ocozacoautla; leg. E.W. Greenwood s. n., BGH 31 712, April 1969; flowered by T. MacDougall No. 814, May 1969; det. L.B. Smith.

Three sheets: (1) two leaves and inflorescence (NOTE: United States National Herbarium: *Vriesea malzinei* E. Morren var. *disticha* L.B. Smith, det. L.B. Smith VIII 1973, Phytologia 22: 87, 1971), (2) three leaves, (3) leaves and inflorescence (NOTE: Mexico, *Vriesea malzinei* E. Morren var. *disticha* L.B. Smith, Isotype, Chiapas: Mal Paso highway about 23 km north of Ocozacoautla. Infl. deep red. Fls. very pale blue, almost greyish; E.W. Greenwood, April 14, 1969; Flowered T. MacDougall May 19, 1969, No. 814).

HOLOTYPE: US.

Vriesea naundorffiae Rauh, Trop. Subtrop. Pflanzenwelt 31: 14–17, Abb. 7, 1979, as “*naundorffii*.”

HOLOTYPE: HEID, Ecuador, probably

- near Lago Agrio; leg. E. Naundorf s. n., BGH 38 943, October 1975; det. W. Rauh.
Two sheets: (1) two leaves, (2) two inflorescences.
Currently named *Werauhia vittata* (Mez & Werckle) J.R. Grant (Grant 1995a).
- Vriesea ochracea** Rauh et E. Gross, J. Bromeliad Soc. 34(5): 196–198, Figs. 2, 3, 1987.
HOLOTYPE: HEID, Peru, Dept. Pasco, Chanchomayo valley near Oxapampa, 1,800 m, growing epiphytically in mountain-forest; leg. A. Lau s. n., BGH 17 442; det. W. Rauh and E. Gross; flowered in the BGH and conserved in September 1986.
Two sheets: (1) two leaves, (2) scape with inflorescence.
Currently named *Werauhia ochracea* (Rauh et E. Gross) J.R. Grant (Grant 1995a).
- Vriesea olmosana** L.B. Smith, Phytologia 13: 113, Figs. 2–4, 1966.
ISOTYPE: HEID, Peru, Dept. Lambayeque, Olmos valley; leg. W. Rauh P 333; det. L.B. Smith.
Two sheets: (1) separated leaves, (2) inflorescence.
HOLOTYPE: US.
Currently named *Tillandsia olmosana* (L.B. Smith) J.R. Grant (Grant 1993b).
- var. **pachamamae** Rauh, Trop. Subtrop. Pflanzenwelt 43: 28–33, Abb. 18–18b, 1983.
HOLOTYPE: HEID, Ecuador, Prov. Azuay, between Sta. Isabel and Pasaje, below Pachamama, 1,650 m, growing on rocks; leg. W. Rauh 38 139, July 1975; det. W. Rauh.
Two sheets: (1) two leaves and inflorescence, (2) seaparted leaves and inflorescence.
CLONOTYPE: HEID, flowered in the BGH and conserved without date.
One sheet: two separate spikes and inflorescence.
CLONOTYPE: HEID, flowered in the BGH and conserved in February 1983.
One sheet: two leaves and inflorescence.
Currently named *Tillandsia olmosana* (L.B. Smith) J.R. Grant var. *pachamamae* (Rauh) J.R. Grant (Grant 1993b).
- Vriesea oxapampae** Rauh, Trop. Subtrop. Pflanzenwelt 16: 22–25, Abb. 12a and 12b, 1976.
HOLOTYPE: HEID, Peru, Dept. Pasco, above of Oxapampa, 1,800 m, growing in mountain-forest; leg. A. Lau s. n., BGH 17 856; det. W. Rauh; flowered in the BGH and conserved in May 1974.
One sheet: inflorescence.
Cultivated in the BGH.
- Vriesea panamensis** E. Gross and Rauh, Trop. Subtrop. Pflanzenwelt 75: 42–44, Abb. 21, 1990, as “*panamaensis*.”
HOLOTYPE: HEID, Panama, Cerro Jefe, 800 m, growing terrestrially in cloud-forest; leg. W. Rauh 44 555, September 1977; det. E. Gross and W. Rauh.
One sheet: one leaf and scape with inflorescence.
Currently named *Werauhia panamensis* (E. Gross & Rauh) J.R. Grant (Grant 1995a).
This species is close to *W. vittata* (Mez & Werckle) J.R. Grant.
- Vriesea parvula** Rauh, Trop. Subtrop. Pflanzenwelt 58: 44–46, Abb. 25, 1986.
HOLOTYPE: HEID, Brasil, Estado São Paulo, without exact locality; leg. G. Pfister s. n., BGH T.32.73; det. W. Rauh.
One sheet: two leaves and inflorescence.
This species is close to *V. oligantha* (Baker) Mez.
- Vriesea patzeltii** Rauh, Trop. Subtrop. Pflanzenwelt 33: 17–20, Abb. 6, 1981.
HOLOTYPE: HEID, Ecuador, Prov. Pichincha, valley of Pinda, near Los Bancos, 1,000 m, growing in mountain-forest; leg. E. Patzelt s. n., BGH 54 337; det. W. Rauh.
Two sheets: (1) two leaves, (2) scape and inflorescence.
Currently named *Werauhia patzeltii* (Rauh) J.R. Grant (Grant 1995a).
- var. **panamensis** Rauh, Trop. Subtrop. Pflanzenwelt 60: 86–89, Abb. 60 and 61, 1987, as “*panamaensis*.”
HOLOTYPE: HEID, Panama, Cerro Jefe, 800 m, growing epiphytically and terrestrially in mountain-forest; leg. R. Dressler s. n., BGH 48 657; det. W. Rauh.
Two sheets: (1) two leaves, (2) scape with inflorescence; material in alcohol.
Currently named *Werauhia greenbergii* (Utley) J.R. Grant (Grant 1995b).
- Vriesea penduliscapa** Rauh, Trop. Subtrop. Pflanzenwelt 18: 21–24, Abb. 8, 1976.
HOLOTYPE: HEID, Ecuador, Prov. Azuay (actually Morona-Santiago), between Limón and Indanza, 1,500 m, growing epiphytically in degraded mountain-forest; leg. W. Rauh 37 955, June 1975; det. W. Rauh.
One sheet: separated leaves and inflorescence.
TOPOTYPE: HEID; leg. W. Rauh 38 090, June 1975; det. W. Rauh.
Three sheets: (1) whole plant with roots

and inflorescence, (2) leaf-rosette, (3) two leaves and inflorescence.

Currently named *Tillandsia penduliscapa* (Rauh) J.R. Grant (Grant 1993b)

This species is close to *T. petraea* L.B. Smith and *T. incurva* Grisebach.

Vriesea piepenbringii Rauh, Trop. Subtrop. Pflanzenwelt 42: 12–21, Abb. 6–7a, 10 and 12, 1983.

HOLOTYPE: HEID, Peru, Dept. Amazonas, valley of the Río Utcubamba, near Ingenio, 1,200 m, growing epiphytically on trees at the riverside; leg. W. Rauh 53 548, July 1980; det. W. Rauh.

Four sheets: (1) whole plant with roots and inflorescence, (2) separated leaves, (3) separated scape bracts, (4) inflorescence; material in alcohol.

This species is close to *V. heterandra* (André) L.B. Smith.

Vriesea rectifolia Rauh, Trop. Subtrop. Pflanzenwelt 50: 16–19, Abb. 7 and 7a, 1984.

HOLOTYPE: HEID, Brasil, Estado Pernambuco, near Correntes, 600–700 m, growing epiphytically in a dry forest; leg. G. Pfister s. n., BGH 65 290; det. W. Rauh.

Two sheets: (1) separated leaves, (2) scape with inflorescence; material in alcohol.

Vriesea rubro-bracteata Rauh, Trop. Subtrop. Pflanzenwelt 27: 13–16, Abb. 5, 1979.

HOLOTYPE: HEID, Colombia, Sumidor, 2,800 m; leg. W. Rauh 37 412, May 1975; det. W. Rauh.

Two sheets: (1 and 2) infructescence with seeds.

Vriesea strobeliae Rauh, Trop. Subtrop. Pflanzenwelt 18: 17–21, Abb. 6 and 7, 1976, as "*strobeliai*."

HOLOTYPE: HEID, Ecuador, Prov. Azuay, Río Paute, near Cuenca, 1,500 m, growing on steep cliffs; leg. W. Rauh and E. Strobel 37 936, July 1975; det. W. Rauh.

One sheet: separated leaves and inflorescence; material in alcohol.

Currently named *Tillandsia strobeliae* (Rauh) J.R. Grant (Grant 1993b).

Vriesea tarmaensis Rauh, Trop. Subtrop. Pflanzenwelt 43: 33–38, Abb. 19, 20a and 21, 1983.

HOLOTYPE: HEID, Peru, Dept. Junin, below Tarma, 2,700 m, growing terrestrially; leg. W. Rauh 21 147a, October 1967; det. W. Rauh; flowered in the BGH and conserved in May 1982.

Seven sheets: (1 and 2) one leaf, (3) sep-

arated leaves, (4) one leaf and pieces of the scape, (5 and 6) pieces of the scape and inflorescence, (7) inflorescence.

Currently named *Werauhia tarmaensis* (Rauh) J.R. Grant (Grant 1995a)

This species is close to *W. sanguinolenta* (Linden ex Cogniaux & Marchal) J.R. Grant.

Cultivated in the BGH.

Vriesea wuelfinghoffii Rauh and E. Gross, Trop. Subtrop. Pflanzenwelt 79: 25–27, Abb. 13, 1991.

HOLOTYPE: HEID, Ecuador, Prov. Azuay, near Cuenca, 1,400 m, growing on steep rock-walls; leg. R. Wülfinghoff s. n., BGH 70 636, December 1989; det. W. Rauh and E. Gross.

Two sheets: (1) separated leaves, (2) leaf-rosette and inflorescence.

Currently named *Tillandsia azuayensis* (Rauh & E. Gross) J.R. Grant (Grant 1994b).

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