

BEAT ERNST LEUENBERGER & SILVIA ARROYO-LEUENBERGER

Humboldt, Bonpland, Kunth and the type specimen of *Rauhia multiflora* (Amaryllidaceae) from Peru

Abstract

Leuenberger, B. E. & Arroyo-Leuenberger, S.: Humboldt, Bonpland, Kunth and the type specimen of *Rauhia multiflora* (Amaryllidaceae) from Peru. – Willdenowia 36 (Special Issue): 601-609. – ISSN 0511-9618; © 2006 BGBM Berlin-Dahlem.

The Humboldt & Bonpland type collection of the name *Phaedranassa multiflora* (now *Rauhia multiflora*) from Peru, located only in the general herbarium at Berlin-Dahlem, is notable for the presence of two field labels and various annotations. New insight in its history of identification and publication is provided by comparison with Bonpland's field book entry and Kunth's protologue. Further notes on the genus *Rauhia* are presented.

Key words: taxonomy, herbarium specimen, history of botany, field notes, typification.

Introduction

Rauhia is a small genus of *Amaryllidaceae* proposed by Traub (1957) with *R. peruviana* Traub as type. The name honours the German botanist Werner Rauh (1913-2000), one of the world's most prolific authors of succulent plants and bromeliads. Ravenna (1969) recognized that *Rauhia peruviana* is conspecific with *Phaedranassa multiflora* Kunth (1850) and validated the combination *Rauhia multiflora* (Kunth) Ravenna. Further species have been described by Ravenna (1978, 1981, 2002), all from the same area in N Peru. The genus is characterised by its carnosae, ovate to oblong, shortly petiolate, slightly glaucous leaves and stout inflorescences with numerous pedicellate, tubular to funnel-shaped, green flowers with free stamens inserted in the throat of the tube. It is closely related to *Phaedranassa* but maintained as distinct by Meerow (1989) and Meerow & Snijman (1998).

The type specimen of the name *Rauhia multiflora*, *Humboldt & Bonpland 3582*, is (like the type specimen of its synonym *Phaedranassa megistophylla* Kraenzlin, *Weberbauer 6225*) among the scarce material that fortunately escaped destruction in 1943 in the Botanical Museum at

Berlin-Dahlem (Hiepko 1978, 1987). It is included in a list of extant neotropical type material of *Amaryllidaceae* in the general herbarium at Berlin-Dahlem (B and B-W) by Arroyo-Leuenberger & Leuenberger (1996) as “ex herb. Humboldt 3582 (holotype)” and belongs to a collection number of Humboldt & Bonpland neither extant in the Willdenow herbarium (B-W) nor at Paris (P and P-Bonpl) (Poncy, pers. comm.).

Relevant details on the fate of the Humboldt & Bonpland herbarium collections in Paris and Berlin, and especially on Humboldt & Bonpland’s field notes have been published. Mentioned first by Lourteig (1977), the field notes, the so called “Journal Botanique”, deposited in the Bibliothèque Centrale du Muséum National d’Histoire Naturelle in Paris (with a copy recently deposited at Berlin-Dahlem), have been brought to the closer attention of botanists and historians more recently by Lack (2001, 2003, 2004a-b). The “Journal Botanique” contains the original field notes mostly prepared by Bonpland and to a lesser degree by Humboldt. Comparisons of labels, field book entries and protologues have since provided valuable information for proper interpretation of the labels and for typification (Rankin Rodríguez & Greuter 2001, Leuenberger 2002a-b). This stimulated us to have a closer look at the labels and a piece of paper with notes mounted on the type sheet of *Rauhia multiflora*, and to compare them with the field book entries, the protologue, and with other Humboldt & Bonpland collections.

Results and discussion

The labels. – The sheet (Fig. 1) contains two small field labels with number and locality, i.e., “No. 3582”, “6 ria” (= hexandria), “Colazi”, in Bonpland’s hand. In specimens not identified to genus, Bonpland used to indicate only the Linnean classification, e.g. “hexandria”, sometimes in abbreviated form, with “hexand” abbreviated to “6” and “ria” with the first letter “r” modified to a different symbol resembling a “f” (Fig. 2, 3).

Later additions on both labels are in different hands. The provisional identification “*Cri-num* ?” on the left label (Fig. 2) could, doubtfully, be by Willdenow (as compared with “*Cri-num*” written by Willdenow in B-W), on the right label (Fig. 3) it is definitely by Kunth, in the same hand as the addition “Ex herb. Humb.”. The word “omittendum!” (Fig. 2) is probably also by Kunth, indicating that it was to be omitted from the treatment in the “Nova genera et species” (Humboldt & al. 1815-25).

Further annotations, clearly in the hand of Kunth, are “*Phaedranassa multiflora* Kth” and “affinis *P. obtusae* Benth?”. This seems to refer to *P. obtusa* Herb. (in Bot. Reg. 1845: sub t. 17), mentioned 1846 by Bentham (1839-57).

These undated annotations reflect Kunth’s doubts about the identification of the specimen. He described the new species formally only in 1850, many years after the publication of most of the Humboldt & Bonpland *Amaryllidaceae* in the “Nova genera et species” (Kunth in Humboldt & al. 1815).

A third, larger piece of paper above the labels gives additional information on the history of examination of this specimen (Fig. 4). It contains a text under the heading “Bonpl. mss. no. 3582”, copied almost word for word by Kunth from the Journal Botanique, with some German script added at the end containing a comment on the ovules in the immature capsules. The very different aspect of Kunth’s neatly written names as compared to the quick notes found on this herbarium sheet matches well the similarly diverging samples published by Burdet (1979).

Further annotations added on this piece of paper give tentative identifications to genus reading “*Urceolaria* Herb., *Collania* Schef, huc pertinet” (= belongs in this direction). *Urceolaria* Herb. and *Collania* Schult. f. are today synonyms of *Urceolina* Rchb., a genus published in 1828. It can be assumed that this undated annotation was made by Kunth in Berlin and that it is anterior to the identification of the specimen as *Phaedranassa multiflora*.

Kunth had the Journal Botanique at hand during his work both in Paris and in Berlin (Lack 2004b). Therefore one would not expect a text copy from the “Journal” kept with the specimen. Very probably, the text copy was written in Paris. The fact that the note remained with the speci-

Crinum?
 No. 3582. C. 512
~~Phaedranassa~~
multiflora Kth. affinis *P. obtusa*
 omissendum. Benth?
 Colazi.

Fig. 2. Left field label (bottom left on Fig. 1) with original text by Bonpland "N° 3582." "6.ria" "Colazi.", additions by Kunth "*Phaedranassa multiflora* Kth affinis *P. obtusa* Benth? omissendum !" and doubtfully by Willdenow "*Crinum?*".

No. 3582. C. 512
 Crinum?
 Ex herb. Humb.
 Colazi.

Fig. 3. Right field label (bottom centre on Fig. 1) with identical original text by Bonpland and additions by Kunth "*Crinum?*" "Ex herb. Humb.".

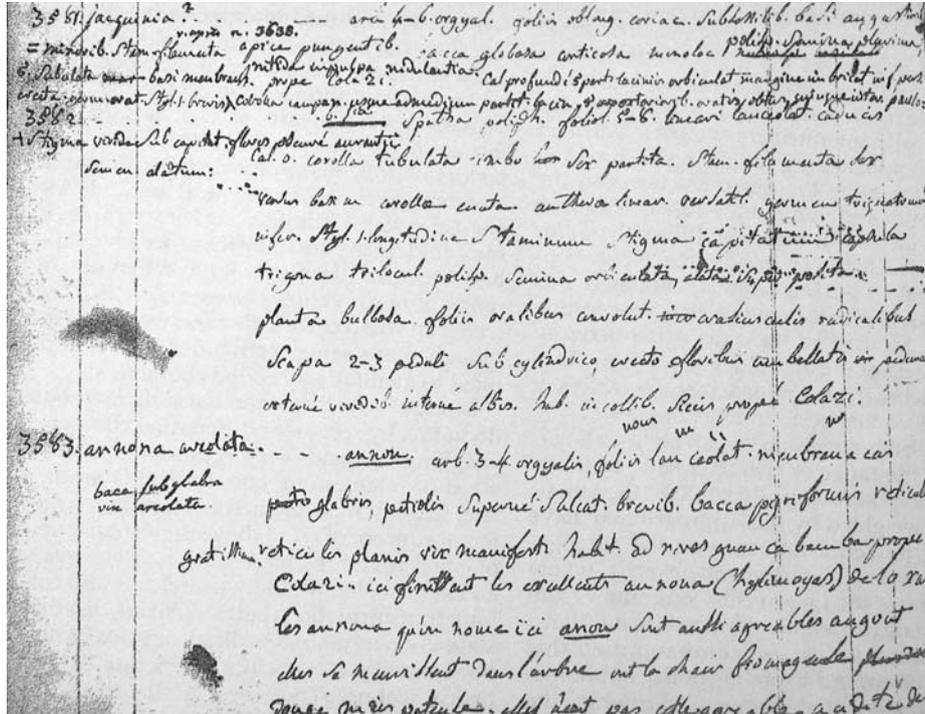


Fig. 5. Part of page in the Journal botanique (MS53: 210) with entry no. 3582 by Bonpland (Bibliothèque Centrale du Muséum National d'Histoire Naturelle Paris, copy at B).

men, inadvertently or unintentionally, can tell something about the working process and seems to indicate that this specimen was a special challenge.

The comparison of the copy with the original entry in the field notes on p. 210 in MS53, copy at B (Fig. 5), shows minor differences. Kunth partly translated the text into his own style and terminology, e.g., “Spatha 5-8-phylla foliolis lineari-lanceolatis caducis” for Bonpland’s original text “Spatha poliph., foliol. 5-8 lineari lanceolat. caducis”.

The specimen. – The material consists of four scapes with flowers, some fallen flowers and young capsules. Since flowers in this species normally appear at the same time as the leaves and were described in the “Journal” by Bonpland, the lack of leaves in the herbarium specimen is at first surprising. However, the large succulent leaves may have been difficult to dry or were for that reason not collected. The same happened with succulent plants and plant parts in other families, e.g., *Cactaceae* (Leuenberger 2002a-b).

The protologue. – In the same manner as in his earlier treatment in the *Nova genera et species* (Humboldt & al. 1815-25), Kunth (1850) distinguished in the protologue of *Phaedranassa multiflora* between characters observed by himself and those found only in the field notes (Fig. 6). Details taken from Bonpland’s field notes were carefully and cautiously referenced, e.g., “Foliis ovalibus (ex Bonpl.)” and “Folia (a me haud visa) ovalia, convoluta, crassiuscula (Bonpl.)” (Kunth 1850: 502).

Conclusions

The presence on this herbarium sheet of two original field labels together with the text copied from the “Journal” is particularly noteworthy. It is best considered as an indication that the mate-

3. *P. MULTIFLORA*. Foliis ovalibus (ex Bonpl.); scapo 2-3-pedali; umbella 14-18-flora; floribus longitudine pedicelli subsesquipollicaris; perigonio tubuloso-infundibulari, apice sexfido; laciniis $\frac{1}{4}$ partis inferioris connatae longis; staminibus una cum columna stylina longiore exsertis. — In collibus siccis prope Colasey. (Provincia Jaen de Bracamoros.) Humb. et Bonpl. leg. 24 — Herba bulbifera, scapigera. Folia (a me haud visa) ovalia, convoluta, crassiuscula. (Bonpl.) Scapus 2-3-pedalis, subcylindricus, erectus. Flores 14-18, umbellati, pedicellati, externe virides, interne albi (Bonpl.). Spatha 5-8-phylla; foliola lineari-lanceolata, caduca. Pedicelli $1\frac{1}{4}$ - $1\frac{1}{2}$ -pollicares, tenues, glabri, bracteis e basi lata lineari-filiformibus 8-9 lin. longis interjectis. Perigonium superum, tubuloso-infundibulare, usque ad $\frac{1}{5}$ partem altitudinis superiorem 6-fidum; laciniis oblongis, obtusis, multinerviis, subaequalibus. Stamina 6, infra medium tubi (tria vix altius) libera evadentia, exserta, alterna paulo longiora. Filamenta filiformia, glabra. Antherae oblongae, emarginatae, basi bilobae, dorso infra medium affixae. Ovarium oblongum, trigonum, triloculare, glabrum, 4-5 lin. longum; ovula in loculis crebra, biseriata?, horizontalia, plana. Columna stylina filiformis, erecta, glabra, stamina superans. Stigma subglobosum, integrum. Capsula (haud suppetit) trigona, trilocularis, polysperma. Semina orbiculata, alata, superposita. (Descr. fructus et seminum ex Bonpl.) Differt a praecedentibus perigonio nonnisi usque ad $\frac{1}{5}$ altitudinis 6-fido, umbella multiflora, caet.

Fig. 6. Protologue of *Phaedranassa multiflora* Kunth, Enumeratio plantarum 5: 502. 1850.

rial remained unidentified for a long time. The complete material including the duplicate was apparently taken by Kunth to Berlin. After Kunth's death, his herbarium was acquired by and finally incorporated in the general herbarium at Berlin (Lack 2003). This explains why a Humboldt & Bonpland holotype is present in the general herbarium at B and no material is found at P-Bonpl and B-W.

Additional remarks

The precise geographical origin of the Humboldt & Bonpland specimen ("Colazi" in the field notes, "Colasey" in the protologue, "Colasay" today) is in the Huancabamba valley in N Peru, in the Department of Cajamarca, Province of Jaén, District of Colasay.

Traub (1957) did not know this specimen, when he established the new genus *Rauhia*, based on a single specimen, *R. peruviana*, Traub 535a (MO 3468277), originally collected by Rauh under the number "P 329" on 25 October 1956 according to the image of the specimen accessible in TROPICOS (see References). No original material is extant at HEID (Dobes, pers. comm. 30.9.2005).

Ravenna (1969) based his synonymisation of *Phaedranassa megistophylla* and *Rauhia peruviana* with *R. multiflora* exclusively on the descriptions. The examination of the Humboldt & Bonpland specimen allows confirmation of the synonymy.

Three further names in *Rauhia* were proposed by Ravenna, all from the provinces of Cajamarca and Amazonas in N Peru: *R. staminosa* Ravenna (1978), *R. decora* Ravenna (1981) and *R. occidentalis* (Ravenna 2002). Excepting the well distinguished *R. decora*, with isotype material at K, these names are based each on a single specimen kept in the private herbarium of P. F. Ravenna and remain insufficiently known.

The excellent and well documented material of the Humboldt & Bonpland collections is of permanent importance in the context of current tropical biodiversity studies. The type specimen of the name *Rauhia multiflora* is a good example for the value and importance of such historical material, too often overlooked or ignored. Increasing accessibility of type specimens and other material in digitised form helps to facilitate such studies globally. This particular specimen is available online (see BGBM 2000-).

Acknowledgements

We would like to thank Odile Poncy (P), Simon Owens and Anna Haigh (K) and Christoph Dobes (HEID) for information on specimens, Paul Hiepko (B) for information and help with the identification of handwritings and two reviewers for useful suggestions improving the text.

References

- Arroyo-Leuenberger, S. & Leuenberger, B. E. 1996: Type specimens of names in American *Amaryllidaceae* at the Berlin-Dahlem herbarium (B and B-W). *De Herbario Berolinensi Notulae* 31. – *Willdenowia* **25**: 693-702.
- Bentham, G. 1839-57: *Plantae hartwegianae*. – London [Reprint 1970, Lehre].
- BGBM 2000- (continuously updated): Digital specimen images at the Herbarium Berolinense. – Published on the Internet <http://ww2.bgbm.org/herbarium/default.cfm> [accessed October 2005].
- Burdet, H. 1979: *Auxilium ad botanicorum graphicem*. – Genève.
- Hiepko, P. 1978: Die erhaltenen Teile der Sammlungen des Botanischen Museums Berlin-Dahlem (B) aus der Zeit vor 1943 (*De Herbario Berolinensi Notulae* 1). – *Willdenowia* **8**: 389-400.
- 1987: The collections of the Botanical Museum Berlin-Dahlem (B) and their history. – *Englera* **7**: 219-252.
- Humboldt, A. de, Bonpland, A. & Kunth, C. 1815-25: *Nova genera et species plantarum*. – *Luettiae Parisiorum*.
- Kunth, C. S. 1850: *Enumeratio plantarum* **5**. – *Stuttgartiae & Tubingae*.
- Lack, H. W. 2001: The plant self impressions prepared by Humboldt and Bonpland in tropical America. – *Curtis's Bot. Mag.*, ser. 6, **18**: 218-229.
- 2003: Alexander von Humboldt und die botanischen Sammlungen in Berlin. – Pp. 107-132 in Hamel, J., Knobloch, E. & Pieper, H. (ed.), *Alexander von Humboldt in Berlin. Sein Einfluss auf die Entwicklung der Wissenschaften*. – *Algorismus* **41**.
- 2004a: Botanische Feldarbeit: Humboldt und Bonpland im Gelände. – *Ann. Naturhist. Mus. Wien, B*, **105**: 493-514.
- 2004b: The botanical field notes prepared by Humboldt and Bonpland in tropical America. – *Taxon* **53**: 501-510.
- Leuenberger, B. E. 2002a: The misunderstood *Cleistocactus serpens* (*Cactaceae*), and *C. longiserpens*, a new species from Peru. – *Bot. Jahrb. Syst.* **124**: 13-30.
- 2002b: Humboldt and Bonpland's *Cactaceae* in the herbaria at Paris and Berlin-Dahlem. – *Willdenowia* **32**: 137-153.
- Lourteig, A. 1977: Aimé Bonpland. – *Bonplandia* **3**: 269-317.
- Meerow, A. 1989: Systematics and evolution of the *Stenomessaeae* (*Amaryllidaceae*). – *Herbertia* **45**: 138-151.
- & Snijman, D. A. 1998: *Amaryllidaceae*. – Pp. 83-110: in Kubitzki, K. (ed.), *The families and genera of vascular plants* **3**. – Berlin, etc.
- Rankin Rodríguez, R. & Greuter, W. 2001: Humboldt, Willdenow and *Polygala*. – *Taxon* **50**: 1231-1247.
- Ravenna, P. 1969: Contribution to South American *Amaryllidaceae* II. – *Pl. Life* **25**: 55-76.

- 1978: Contribution to South American *Amaryllidaceae* VII. – Pl. Life **34**: 69-91.
 - 1981: Contribution to South American *Amaryllidaceae* VII [VIII]. – Pl. Life **37**: 57-83.
 - 2002: New *Rauhia* species from northern Peru (*Amaryllidaceae*). – Onira, Bot. Leaflet. **7(4)**: 11.
- Traub, H. P. 1957: Genus *Rauhia* and *R. peruviana* gen. & sp. nov. – Pl. Life **13**: 73-75.
- TROPICOS [without year]: Missouri Botanical Garden's VAST (VAScular Tropicos) nomenclature database and associated authority files. – Published on the Internet <http://mobot.mobot.org/W3T/Search/vast.html> [accessed September 2005].

Address of the authors:

Beat Ernst Leuenberger, Silvia Arroyo-Leuenberger, Botanischer Garten & Botanisches Museum Berlin-Dahlem, Freie Universität Berlin, Königin-Luise-Str. 6-8, D-14195 Berlin, Germany; e-mail: b.leuenberger@bgbm.org