Corrections to Phytologia,vol. 102 (3) – *Rumicastrum dielsii* (Poelln.) Carolin is an "alien," *R. cylindricum* (Poelln.) Carolin is Elatinaceae, *R. monogynum* (Poelln.) Carolin is incertae sedis, and the combination in *Rumicastrum* for *Talinum nanum* Nees was neglected

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ABSTRACT:

In Phytologia 102 (4): 116–123, Hershkovitz recombined into *Rumicastrum* Ulbrich 65 Australian Montiaceae species originally classified in *Calandrinia* Kunth. Three of these species, all described by Karl von Poellnitz, do not pertain to *Rumicastrum*. The type specimen of *Rumicastrum dielsii* (Poelln.) Carolin is *Calandrinia menziesii* (Hook.) Torr. & A.Gray, a western North American species naturalized in Australia. The type specimen of *Rumicastrum cylindricum* (Poelln.) Carolin appears to be *Bergia* L. (Elatinaceae), but the species is not determined here. The type specimen of *Rumicastrum monogynum* (Poelln.) Carolin has not been located and may have been destroyed. The protolog is incomplete, but the specified characteristics suggest that it does not pertain to Montiaceae. Its identity is not determined here. In addition to the above, Hershkovitz listed *Calandrinia pusilla* Lindl., nom illegit., as a nomenclatural rather than taxonomic synonym of *Rumicastrum eremaeum* (Ewart) Carolin. Although homotypic, it is a taxonomic synonym. The status of other possible taxonomic synonyms combined into *Rumicastrum* also is discussed. Finally, Hershkovitz ascribed authorship of several *Rumicastrum* combinations to Roger Carolin. The question as to whether authorship should be ascribed as "Carolin ex Hershk." is here addressed.

KEY WORDS: *Rumicastrum*, *Calandrinia*, *Parakeelya*, Montiaceae, Elatinaceae, Australia.

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Hershkovitz (2020a) recombined into *Rumicastrum* Ulbr. 65 Australian Montiaceae species originally classified in *Calandrinia* Kunth. These included 34 species previously erroneously recombined by Hershkovitz (1998) into *Parakeelya* Hershk. (see Hershkovitz, 2019, 2020a), 23 species of *Rumicastrum* named since then, and eight species that were not transferred into *Parakeelya* either because they were considered by Hershkovitz (1998) to be synonyms of other species (five) or because they were simply overlooked (three).

It is remarkable that *none* of the three species described by Poellnitz (1934), overlooked by Hershkovitz (1998) and recombined into *Rumicastrum* by Hershkovitz (2020a), actually pertain to *Rumicastrum*. Two do not even pertain to Montiaceae. Nonetheless, how or why these species were overlooked by Hershkovitz (1998), which cited Poellnitz (1934), is not recalled. And it does not really matter.

In any case, Hershkovitz (2020a) recombined all names accepted at that time and currently in one or more major online global and Australian taxonomic databases. All three of these names currently are accepted species in all databases. The global databases are GBIF (GBIF Secretariat, 2017), Plants of the World Online (POWO, 2019.), and World Flora Online (WFO, without year). The Australian databases

include the linked Australian Plant Name Index (APNI, without year) and the Australian Plant Census (APC, without year). The former also provides links to several Australian regional taxonomic databases, which usually follow APC taxonomy, but not always. Also, evidently names in APNI are not always provided with links to all of the relevant Australian databases. Of particular interest here is FloraBase—the Western Australian Flora (Western Australian Herbarium, 1998–). Hereafter, these databases are referred to by their acronyms only.

Obviously, it is unfortunate that Hershkovitz (2020a), without studying the descriptions and type material, unnecessarily created three synonyms in *Rumicastrum* for three species that do not pertain to this genus. But I cannot bear full responsibility. After all, it was not me, but the distinguished Baron Dr. Poellnitz who described them in *Calandrinia* in the first place. And it was not me, but an international assemblage of experts working throughout the subsequent 80 years ultimately responsible for the designation of the species as "accepted" in multiple global and Australian online databases. So the corrections provided here actually represent an advance that outweighs the inconvenience of a few superfluous synonyms.

Another oversight in Hershkovitz (2020a) was the failure to recombine the combination *Talinum nanum* Nees in *Rumicastrum*. Also, Hershkovitz (2020a) indicated (with the symbol "≡") that *Calandrinia pusilla* Lindl. is a nomenclatural synonym of *Rumicastrum eremaeum* (Ewart) Carolin. It is a taxonomic synonym. Hershkovitz (2020a) provided no justification for recombining into *Rumicastrum* names in *Calandrinia* that are commonly considered to be taxonomic synonyms of other species. Finally, a question has emerged as to the validity of taxon authorships ascribed in Hershkovitz (2020a) to Roger Carolin.

All of the points above are articulated in detail below.

1. Assessment of Poellnitz' three species

Calandrinia cylindrica Poelln., Repert. Spec. Nov. Regni Veg. 35: 163. (15 June) 1934. ≡ *Rumicastrum cylindricum* (Poelln.) Carolin, Phytologia 102(3): 118. (21 Sept) 2020. TYPE: *Morrison s. n.*, "16.11.1904" (B; https://herbarium.bgbm.org/object/B100347201).

The name *Calandrinia cylindrica* is accepted currently in GBIF, POWO, WFO, APC, and FloraBase.

My immediate impression from the standard resolution image of the type specimen was that it pertained to *Montia*. It appears as a semi-aquatic plant with what appear to be adventitious roots at some nodes, small linear and opposite leaves, and axillary flowers with capsulate fruits. However, Poellnitz (1934) described the seeds as cylindrical, intensely brown, ca. 0.5 mm long X 0.13 mm broad. This does not correspond to any Montiaceae or, for that matter, to any Caryophyllales.

Strangely, Poellnitz (1934: 166) classified *C. cylindrica*, together with the naturalized North American species *C. menziesii*, in *Calandrinia* sect. *Axillares* Reiche (= *C.* sect. *Calandrinia*; Hershkovitz, 2019), a section Reiche (1897) described for certain annual Chilean *Calandrinia* [s.l.] species. Poellnitz distinguished *C. cylindrica* and *C. menziesii* based on size and seed morphology. It should not be overlooked that Poellnitz (1934) *did not* classify *C. cylindrica* in any of his six sections of native Australian calandrinias.

The description and type specimen image of *C. cylindrica* correspond to *Bergia* L. (Elatinaceae), a genus with several species in Australia (Leach, 1989). The main discrepancy is that, as indicated by

Poellnitz (1934: 162), *Calandrinia* [s. l.] species have two sepals, which Poellnitz and several other authors refer to as "involucral leaves," the petals then referred to as tepals. *Bergia* species have 3–5 sepals, although the inner two may be morphologically distinct from the outer three (Leach, 1989). But the seed shape and size seem to be less subject to erroneous description, so I presume that Poellnitz misinterpreted the sepals in *Calandrinia cylindrica*.

Poellnitz (1934: 161) also highlighted the fruit morphology of *Calandrinia cylindrica* as distinctive among the described Australian *Calandrinia* (i.e. *Rumicastrum*) species. Although difficult to translate, he described the dehiscing capsules as "blossoms," suggesting that the valves separate and spread in a way as to appear similar to tepals spreading at anthesis, thus exposing the seeds inside. This is more or less the way Bentham (1863: 179) described capsule dehiscence in *Bergia*.

However, I cannot identify the *Bergia* species of Morrison specimen. Poellnitz' (1934) description keys best to *B. pusilla* Benth, but the seed color in this species is pale, not intensely brown. The type specimen of *Calandrinia cylindrica* grossly resembles more a "miniature" plant of *Bergia pedicellaris* (F. Muell.) Benth., viz., all of its morphological dimensions are perhaps one quarter to one third of that of the latter species.

Another problem is that *Bergia* species are mainly sub(tropical), extending to temperate latitudes only in eastern Australia (Leach, 1989; cf. FloraBase). The type specimen of *Calandrinia cylindrica* is given as "Hotham River," which is at about 32°S in Australia's mediterranean climate zone. No species of *Bergia* distribute within several hundred km of this locality. However, a sub(tropical) annual might well disperse to the temperate zone and survive there for a single season. This is especially plausible in both western and eastern Australia, where temperate and tropical latitudes are not separated by seas, mountains, or extreme deserts.

Calandrinia dielsii Poelln., Repert. Spec. Nov. Regni Veg. 35: 163. (15 June) 1934. ≡ *Rumicastrum cylindricum* (Poelln.) Carolin, Phytologia 102(3): 118. (21 Sept) 2020. TYPE: *Diels 3573* (B; https://herbarium.bgbm.org/object/B1003472012).

The name *Calandrinia dielsii* is accepted currently in GBIF, POWO, WFO, APC, and FloraBase.

The type specimen image, even in standard resolution, appears to me unmistakably as *C. menziesii*, a species with which I have been especially familiar for nearly 40 years (damn, I feel "old"!). Poellnitz (1934: 161) even noted the similarity in sepal morphology, ciliate along the margins and the dorsal keel. This characteristic is a morphological synapormorphy of *Calandrinia* s. str. (i.e., excluding *Rumicastrum*; Hershkovitz, 2020b: 1). The type specimen image also reveals the distinctive leaf intramarginal veins unique to *Calandrinia* s. str. (Hershkovitz, 1993).

Poellnitz described the number of stigma lobes as four and the capsule as four-valved, splitting upwards from basal. For the latter reason, he classified *C. dielsii* in his *Calandrinia* section *Basales* Poelln. However, the type specimen is a single, small, and rather immature individual, and there appear to be no mature fruits. Possibly there were more mature duplicates in B or distributed to other herbaria. I cannot explain Poellnitz' description of the capsule.

According to the Australian Virtual Herbarium (AVH, 2021), there was an "anonymously" collected specimen identified as *Calandrinia dielsii* in the herbarium in Perth (PERTH 3901580). But the record notes that "*PERTH does not currently have any collections of this taxon. It would appear from the*

loans paperwork that the collections are with Judy West in CANB. A fax has been send [sic] to Judy on the 21 Sept. 1994 requesting their return or photocopies of the specimens as any [sic] interim measure."

Calandrinia monogyna Poelln., Repert. Spec. Nov. Regni Veg. 35: 162. (15 June) 1934. ≡ *Rumicastrum cylindricum* (Poelln.) Carolin, Phytologia 102(3): 120. (21 Sept) 2020. TYPE: "*W. I. George*" [sic; = *W. J. George*] *s. n.*, not located.

The name *Calandrinia monogyna* is accepted currently in GBIF, POWO, WFO, APC, and FloraBase.

The type or *any* collections from Australia by "George" were not found in the B virtual herbarium, and I was unable to locate a probable duplicate in various other herbarium databases, including E, K, US, as well as TROPICOS and JSTOR.

Without the type, the only basis for identification is the description, which is lacking for the leaves, fruit, and seeds. I provide below a translation of Poellnitz (1934) description:

Small annual; leaves unknown; inflorescence terminal, lax, few-flowered; involucral leaves 2–3 mm long, boat-shaped, margin membranous; tepals 5, red, 3–4 mm long, oblong, sub-emarginate; stamens 5, base noticeably dilated, 2 mm long, anthers minute, oblong; ovary 1.25 mm long, carpels 3, ovules 3, style scarcely 0.5 mm long, stigma simple; capsule and seeds unknown.

Poellnitz (1934) was unable to classify this species in any section of *Calandrinia* [s. l.; including *Rumicastrum*]. He remarked that the simple (not even lobed) stigma distinguished this species from all others in the genus. I would go further and say that the described gynoecium characterizes no Montiaceae. The plant would appear to be an annual eudicotyledon, and there are only so many possibilities with this combination of inflorescence and floral characters. But, offhand, I cannot think of a good candidate. Thus, I leave this name as incertae sedis. Little help?

2. The combination in *Rumicastrum* for *Talinum nanum* was neglected

Hershkovitz (2020a) failed to provide the combination in *Rumicastrum* for *Talinum nanum* Nees (in Endl., Pl. Preiss. 1: 246. 1845). This was a careless oversight, as Hershkovitz (1998 [1999]) provided the combination *Parakeelya nana* (Nees) Hershk.

The reason for the oversight owes to a combination of amnesia and the complicated taxonomic history of this taxon. *Talinum nanum* was renamed by Mueller as *Calandrinia pygmaea* F. Muell. (Fragm. 1: 175. 1859 non *C. pygmaea* A.Gray, Proc. Amer. Acad. Arts 8: 623. 1873). This name is illegitimate per the ICN, Articles 11.4 and 52.1 (Turland et al., 2018). The correct name in *Calandrinia* would have been *Calandrinia nana*.

But the combination *Calandrinia nana* subsequently was usurped by Philippi for a different plant, *Calandrinia nana* Phil. (Anales Univ. Chile 85: 304. 1894). Eichler realized this and subsequently published *Calandrinia neesiana* H.Eichler (Taxon 12: 295. 1963) as the legitimate replacement name for *Talinum nanum* in *Calandrinia*. This name has priority from 1963, which is why POWO, WFO, APNI, and APC list *C. neesiana* as a *taxonomic* synonym of *Calandrinia granulifera* Benth (Fl. Austral. 1: 176. 1863). [However, at this writing, GBIF erroneously lists *C. granulifera* and *C. neesiana* as synonyms of the illegitimate name *C. pygmaea* F. Muell.] *Calandrinia granulifera* has priority over *C. neesiana* when

the two are considered the same species, even though the latter actually replaces the older name *Talinum nanum*. However, priority of Nee's epithet is restored in either *Parakeelya* or *Rumicastrum*.

As a minor aside, at this writing, APNI indicates that Hershkovitz (2020a: 119) lists *Talinum nanum* and *Parakeelya nana* Hershk. as *nomenclatural* synonyms of *Rumicastrum graniliferum* (Benth) Carolin and its nomenclatural synonyms. This is not correct. Using the symbol "=" rather than "≡ ," Hershkovitz clearly indicated that these are taxonomic synonyms.

The combination to be proposed in valid (not preprint) publication is:

Rumicastrum *nanum* Carolin, comb. nov. Basionym: *Talinum nanum* Nees in Lehm., Pl. Preiss. 1: 246. (9–11 Feb.) 1845. = *Calandrinia pygmaea* F. Muell. Fragm. 1(7):175. (Sept.) 1859, nom. illegit. ≡ *Calandrinia neesiana* Eichler, Taxon 12: 295. 1963. ≡ *Parakeelya nana* (Nees) Hershk., Phytologia 84(2): 102. (Feb.) 1998 [published Feb 1999].

3. Calandrinia pusilla Lindl. is a taxonomic synonym of *Rumicastrum eremaeum*.

Hershkovitz (2020a) used the symbol "≡" (signifying nomenclatural synonymy) to qualify synonymy of *Calandrinia pusilla* Lindl. (J. Exped. Trop. Australia [Mitchell] 360. 1848. nom illegit., non *C. pusilla* Barnéoud, Fl. Chil. [Gay] 2(4): 485. 1847 ["1846"] with *Rumicastrum eremaeum* (Ewart) Hershk. The basionym of the latter, *Calandrinia eremaea* Ewart, is a homotypic replacement synonym for the illegitimate *C. pusilla* Lindl. Despite sharing the same type, an illegitimate name cannot be a basionym for a combination, and likewise cannot be a nomenclatural synonym. As noted by APNI, the combination in *Rumicastrum* is a taxonomic synonym.

4. Comments on other taxonomic synonyms

Hershkovitz (2020a) combined into *Rumicastrum* five names that are accepted in POWO and WFO, but which are considered taxonomic synonyms in GBIF and APC and were considered as such in Hershkovitz (1998 [1999]). These are: *R. dipetalum* (J. M. Black) Carolin, *R. cygnorum* (Diels) Carolin, *R. maryonii* (S. Moore) Carolin, *R. morrisae* (Goy) Carolin, and *R. tepperianum* (W. Fitzg.) Carolin. But at this writing, *Calandrinia tepperiana* is accepted in FloraBase. I make no judgment concerning the taxonomic synonymy of these species. I merely provided the recombinations necessary to correct names accepted in one or more current taxonomic databases.

5. Comments on authorship

Hershkovitz (2020a) ascribed authorship of the names of many combinations in *Rumicastrum* to Roger Carolin (alone). APNI has stated the following:

"*Hershkovitz refers to an unpublished manuscript by Carolin and ascribes authorship of all new combinations in Rumicastrum from that manuscript to Carolin alone. The existence of Carolin's unpublished work is not regarded as constituting a contribution by Carolin to the present publication under ICN Art. 46.5 (Shenzhen Code, 2018* [Turland et al., 2018]*), so authorship is here given as Carolin ex Hershk.*"

This may be an issue for the "courts" to decide. The relevant portion of ICN Art. 46.5 (Turland et al., 2018) is as follows:

"***46.5****...A new combination, name at new rank, or replacement name is attributed to the author(s) of the publication in which it appears, although it was ascribed to a different author or different authors, when no separate statement was made that one or more of those authors contributed in some way to that publication. However, in both cases authorship as ascribed, followed by "ex", may [italics mine] be inserted before the name(s) of the publishing author(s).*"

Note that insertion of an "ex" between the ascribed and publishing author is optional.

I copy here from Hershkovitz (2020a: 117) the "separate statement" alluded to in Art 46.5:

"*Here, I complete what Roger Carolin started in his unpublished manuscript...To recognize Carolin's contribution, I credit him as the author for all names in Rumicastrum included in his manuscript...*"

I call attention to Art. 46.2, which refers to the same provisions of Art. 46.5. Several examples are offered similar to Hershkovitz (2020a) in which the ascribed author is different from the publishing author, and the latter is not included in the authorship as "ex."

When Carolin sent me his catalogs of recombinations in 1986, he invited me to publish them, but requested to be included as co-author. I replied that I only intended to publish recombinations as I needed to use them in my publications, and that I had no intention of publishing the complete catalogs. However, in the case where I duplicated a recombination in his catalog, I offered to ascribed authorship as "Carolin ex Hershk." Carolin expressed satisfaction with this proposal.

A decade later, as I have described in Hershkovitz (2019: 52), I did attempt to recombine a single name in *Rumicastrum*, but was thwarted by a journal editor. Hence, *Parakeelya* was born. Shortly thereafter, I reluctantly agreed to provide a taxonomic synopsis of *Parakeelya* (Hershkovitz, 2002), and only for this reason did I publish a catalog of recombinations in this genus (Hershkovitz, 1998 [1999]).

But Hershkovitz (2020a) indeed was, in part, publication of Carolin's work. Presented with several options, I opted to extend to him full authorship.

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