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Nomenclature history of the genus *Krascheninnikovia* (Chenopodiacaeae) or the fate of an unpopular generic name

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Abstract: Heklau, H. 2010: Nomenclature history of the genus *Krascheninnikovia* (Chenopodiacaeae) or the fate of an unpopular generic name. Schlechtendalia **20**: 91–98.

The generic name *Krascheninnikovia* (Chenopodiacaeae) is widely used in the current taxonomic literature, but the name *Ceratoides* has nomenclatural priority over *Krascheninnikovia* (Reveal & Holmgren 1972). The name *Ceratoides*, however, was rarely employed. Therefore and by reasons of the history of the generic name, *Krascheninnikovia* was proposed as a genus name to be conserved against *Ceratoides* (Heklau 2006).

The fate of the unpopular generic name *Krascheninnikovia* in the botanic history is presented in detail.

Zusammenfassung: Heklau, H. 2010: Die Nomenclatur-Geschichte der Gattung *Krascheninnikovia* oder das Schicksal eines unbeliebten Gattungsnamens. Schlechtendalia **20**: 91–98.

In der taxonomischen Literatur ist der Gattungsname *Krascheninnikovia* (Chenopodiaceae) weit verbreitet, obwohl es nicht der gültige Name ist. Nach den Regeln des ICBN hat der Name *Ceratoides* em. Reveal & Holmgren eindeutig Priorität (Reveal & Holmgren 1972). Da der Gattungsname *Ceratoides* jedoch wenig Beachtung findet und bei seiner Typisierung die historischen Fakten, die gegen *Ceratoides* sprechen, völlig unberücksichtigt blieben, wurde dem Nomenklatur-Komitee der Vorschlag zur Konservierung des Gattungsnamens *Krascheninnikovia* (Heklau 2006) unterbreitet. In diesem Artikel wird nun die Geschichte des unbeliebten Gattungsnamens *Krascheninnikovia* im Detail aufgezeigt.

Key words: *Diotis, Ceratospermum, Eurotia, Ceratoides.*

Introduction

Morphological, morphometric and molecular phylogenetic studies in the Eurasian/North American genus *Krascheninnikovia* Gueldenst. suggest to synonymise all previously described taxa of this genus under the single species *K. ceratoides* (L.) Gueldenst. (Heklau & Röser 2008). In the botanical literature the genus *Krascheninnikovia* is currently cited by different generic names. In the systematic and floristic literature of Central Asia and North America the generic names, *Ceratoides* [Tournefort] Gagnebin em. Reveal & Holmgren and *Eurotia* Adanson em. C.A. Mey. are mostly found apart from *Krascheninnikovia*.

Under the current rules of nomenclature, *Ceratoides* [Tournefort] Gagnebin is the correct name, not *Krascheninnikovia*.

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Dandy (1967) called attention to the generic name *Ceratoides* as being older than *Krascheninnikovia*, and he indicated that *Krascheninnikovia* and *Ceratoides* are homotypic synonyms. Reveal & Holmgren (1972) lectotypified *Ceratoides* on *Axyris ceratoides* L. *Ceratoides* is unfortunately the nomenclaturally correct name for the genus concerned and *Krascheninnikovia* its synonym.

But Reveal & Holmgren (1972) ignored the treatments of this genus by the authors of the eighteenth and nineteenth centuries, as well as the intentions of Gueldenstaedt (1772).

Because of an analysis of the complete historical literature to the nomenclature, we proposed (Heklau 2006) the conservation of *Krascheninnikovia* against *Ceratoides* as a contribution to stability of nomenclature in this group of chenopodiaceous genera, in accordance with Art. 14 of the ICBN. In this paper the historical motives are presented for the proposal to conserve the generic name *Krascheninnikovia*.

The analysis of the historical literature

The generic name *Krascheninnikovia*

Krascheninnikovia ceratoides was cited as *Axyris ceratoides* L. in the work "Species plantarum" of Linné (1753) which was defined by the ICBN as the starting point of the current binary nomenclature system. The epithet *ceratoides* (hornlike) refers to the description of this species by Tournefort (1703) as "Ceratoides orientalis fruticosa, elaeagni folio" (The oriental shrub Ceratoides with the leaf of Elaeagnus). Tournefort (1703) defined *Ceratoides* as a genus which contains the semishrub and two annual species. These annual species are currently regarded as the species of *Ceratocarpus*. Linné added this name from Tournefort and the designation "Urtica foliis lanceolatis, semininis hirsutis" (Urtica with lanceolate leafs and rough-haired seeds) by Royen (1740) as synonyms to *Axyris ceratoides*.

With the arrangement of *Axyris ceratoides* in the twenty-first class "Monoecia Triandria" (Monoecious plants whose masculine flowers have only three stamina),

Linné (most likely) followed the until-now unpublished description of Georg Wilhelm Steller (1709–1746), a naturalist of the Siberian flora. He described this species as "Blitum arborescens incanum Lavandulae folio" (The treelike, grey Blitum with the leaf of Lavandula) in the "Flora Irkutiensis" (1739, no. 767) and added detailed information about the morphology, the radiation and the structure of flowers. Steller observed only three stamina in the masculine flowers: "Flos imperfectus stamineus nec acie oculorum, ut ut intentu florum et staminum densissime axi adnatorum numerum et figuram ita et nec semen aut analogum quidpiam saltem detegere licuit et quamvis tri stamina. vidisse mihi videor,...ipse dubito..." (Because of the extended flowers [petals] and stamina, which grew very close to the axis, it was not possible, however good the sight was, to observe the number (of stamina) and the structure of the masculine flowers or to observe either the seeds or something similar. Although it seemed to me that I have seen three stamina, ... I doubt myself).

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A scientific paper by Savage (1945) supports that in the year 1748 Linné obtained material from 320 plants and 62 samples of seeds from Siberia that had been collected partly by Steller and partly by Grigori Akinfejevitsch Demidov. Steller came into contact with Demidov in Solikamsk in the year 1746. Demidov started a correspondence with Linné, to whom he sent plant and seed material from Siberian plants that Steller had left behind in his garden. The number 1101/2 example of *Axyris ceratoides,* which is preserved in the Linné herbarium and kept in collection of the Linnean Society in London, is probably an example that came from Demidow (Savage 1945). The example 1101/2 is however only provided with the name of the species and with a special sign that links its origin to East Asia.

In the third volume of Johann Georg Gmelin's "Flora Sibirica", which was posthumously edited by his nephew Samuel Gottlieb in 1768, it is reliably mentioned that Linné had received seeds of *Axyris ceratoides* from Siberia (Fig. 1).

Gueldenstaedt (1772) analysed once again the flower structure of *Axyris ceratoides* and found four, instead of three, stamina in the masculine flowers, which were surrounded with a four-part perigon. He came to the conclusion that *Axyris ceratoides* "… , cui cum Axyride vix ulla, cum Atriplice et Urtica haud pauca et cum Ceratocarpo adhuc plura communia sunt." (has with *Axyris* few, with *Atriplex* and *Urtica* somewhat more and with *Ceratocarpus* the most common features).

Because of the mistake in the identification of flower structure, Gueldenstaedt established the new genus *Krascheninnikovia* for *Axyris ceratoides* and described the species as *Krascheninnikovia ceratoides.* Gueldenstaedt recognized the scientific work of the Russian botanist Stepan Krascheninnikov (1711–1755) with this generic name (Fig. 2, 3).

The splitting of the genus *Axyris* L. into *Axyris* s. str. with annual plants and into *Krascheninnikovia* with the semishrub that was from then on accepted by all authors was based on the difference in the growth form.

The generic names *Diotis* and *Ceratospermum*

In the eighth editon of the „Genera plantarum", Schreber (1789) introduced the genus *Diotis* Schreber and cited *Axyris ceratoides*, *Ceratoides* Tournefort and *Krascheninnikovia* as synonyms. Schreber placed his new genus in the class "Monoecia Tetrandria" (unisexual plants whose masculine flowers have four stamina), recognising the new knowledge about the flower structure. But, he left the genus *Axyris* in the class "Monoecia Triandria" (unisexual plants whose masculine flowers have three stamina).

Because Schreber (1789) cited all until-then known names, it is apparent that he had possessed a good overview of the nomenclature and that he had the aim to choose a generic name that expressed a distinguishing feature. He himself did not combine *Axyris ceratoides* into *Diotis ceratoides*, but Willdenow (1805) did.

Willdenow assumed the genus *Diotis* of Schreber (1789) in the fourth edition of the work "Species plantarum" and described the species *Diotis ceratoides* (L) Willd. with the German name "Orientalisches Doppelohr" (Oriental double-ear).

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Fig. 1: The first drawing of *Krascheninnikovia ceratoides* in the Flora Sibirica, Tomus III. 1768, Tabula II, Figura I (plant right). The plant left: *Axyris hybrida*, Tabula IV, Figura 1.

The monotypic genus *Ceratospermum* of Persoon (1807) is valued as just the same. Persoon arranged *Axyris ceratoides* and *Diotis* [without epithet] in the synonymy of *Ceratospermum papposum* Pers. He took over unchanged the three annual species of *Axyris* from Linné. Persoon left this *Axyris* ssp. among the "Monoecia Triandria," but he arranged *Ceratospermum papposum* to the "Monoecia Tetrandria."

Both names, *Diotis ceratoides* and *Ceratospermum papposum* Pers. are illegitimate names; they were nomenclaturally superfluous when published (ICBN 2000, Article 52). A legitimate name must not be rejected merely because it is inappropriate or disagreeable (ICBN, Artikel 51).

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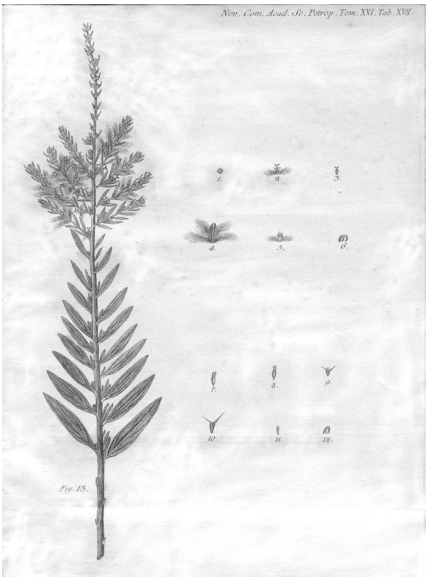




Fig. 2 (left): The second drawing of *Krascheninnikovia ceratoides* in GUELDENSTAEDT (1772), Tabula XVII, Figura 13.
Fig. 3 (right): Portrait of Stepan Krascheninnikov (1711–1755). Copperplate. St. Petersburg, Archives of Academy of sciences in HINTZSCHE & NICKOL (1996).

The generic name *Eurotia*

In the new description of *Axyris ceratoides*, Meyer (in LEDEBOUR 1833) refered to the genus *Eurotia* that ADANSON (1763) had established as a synonym to the genus *Ceratoides* TOURNEFORT (1703) and to *Axyris* In the definition of *Eurotia,* ADANSON (1763) characterized the masculine flowers with three stamina and a three-part perigon. Adanson himself did not introduce new species in these genera. Because of his conception all species of *Ceratoides* (TOURNEFORT 1703) and all species of *Axyris* belonged to the genus *Eurotia*.

Eurotia is an illegitimate name, too, because it was nomenclaturally superfluous when published (ICBN, Article 52).

The generic name *Ceratoides*

REVEAL & HOLMGREN (1972) created the combination *Ceratoides latens* (J.F. Gmel.) Reveal & Holmgren as a replacement for *Krascheninnikovia ceratoides*.

The pre-Linnaean *Ceratoides* of Tournefort (l.c.) was validly published by GAGNEBIN (1755) but without mentioning any species of this genus.

As a result of his oriental voyage of discovery Tournefort had described new species and genera, which appeared as a list under the title “Corollarium...” (1703).

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Gagnebin (1755) dealt only with the arrangement of some plants of the "Corollarium..." in the system of Tournefort (1700); what Tournefort (1703) himself, except for the arrangement in the classes, had not carried out.

Gagnebin added *Ceratoides* (Tournefort 1703) in the end of the fifth section (monoecious herbs with apetalous flowers) after *Ricinus* in the fifteenth class (herbs and semishrubs) in the system of Tournefort (1700): "…dans la 5. Section après le Genre Ricinus."

Gagnebin did not study the species of *Ceratoides* in Tournefort (1703).

Therefore apparently, the genus *Ceratoides* [Tournefort] of Gagnebin has priority over that of *Krascheninnikovia* if both genera are regarded as synonyms.

Because the epithet *ceratoides* cannot be used in combination with the name of the genus (tautonym, ICBN, article 23), Reveal & Holmgren took up the epithet *latens* (undetected) from J.F. Gmelin (1791). In the new version of the "Systema naturae" of Linné, Gmelin (1791) had introduced the name "*Kraschenninikofia latens*" as a synonym to *Axyris ceratoides* and *Krascheninnokovia ceratoides*. There exists furthermore a matter concerning the incorrect spelling of the generic name of Gueldenstaedt.

Reveal & Holmgren (1972) proposed *Axyris ceratoides* as lectotype. Because this lectotypification under Art. 9.17, *Ceratoides* is unfortunately the nomenclaturally correct name for the genus concerned.

Early critical treatment of the genus *Ceratoides* in the 18th century

Tournefort (1703) had placed in his genus *Ceratoides* not only the semishrub "Ceratoides Orientalis fruticosa, elaeagni folio," but also the two annuals "Ceratoides Orientalis, major annua, Psyllii folio" and "Ceratoides Orientalis, minor annua, Psyllii folio."
When Buxbaum (1728) first introduced "Ceratocarpus" he included the two annual species of Tournefort's "Ceratoides" in synonymy (as "Ceratoides folio Psyllii"). Linnaeus (1753: 969), in validly publishing *Ceratocarpus* with the one species *C. arenarius* L. referred to Buxbaum (1728) but not to Tournefort (1703).

Linné (1753) adopted the generic name *Ceratocarpus* from Buxbaum (1728). Buxbaum had also given an illustration of the species, but with no accompanying name. He gave only the generic name *Ceratocarpus*.

Gueldenstaedt (1772) agreed with Buxbaum (1728) that the annual species of *Ceratoides* (Tournefort 1703) belong to *Ceratocarpus* and arranged these species as synonyms to *Ceratocarpus* (Buxbaum 1728) in the discussion of the genus *Ceratoides* (Tournefort 1703):

"Tournefortius, qui omnium primus plantam in Oriente lectam proposuit, cum Ceratoidi orientali maiori et minori, annua, Psyllii folio, seu cum Ceratocarpo BUXBAUMII et LINNAEI eiusdem generis esse putavit; …" (Tournefort, who was the first to describe the plant [means the semishrub] collected in the Orient, thought that this plant belonged to the same genus with [the annuals] Ceratoides orientalis major et minor, annua, Psyllii folio or with *Ceratocarpus* of Buxbaum and Linné).

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Although Gueldenstaedt (l.c.) had transferred one of the three original Tournefort elements (the semishrub) of *Ceratoides* to the new genus *Krascheninnikovia*, while confining the former genus to the two annual species that he associated with *Ceratocarpus,* neither of these actions meet the requirements of ICBN Art. 7.11 (McNeill 2006) for a type designation.

Throughout most of its history, the application of the name *Ceratoides* has been confusing and inconsistent. Although generally relegated to synonymy, most eighteenth and nineteenth century authors synonymized it under *Ceratocarpus*, although its type belongs to the genus now commonly known as *Krascheninnikovia*, to which this name has seldom been applied. On the other hand, the name *Krascheninnikovia* is now commonly used in the taxonomic literature for the genus formerly known under the illegitimate name Eurotia. The proposed conservation of *Krascheninnikovia* against *Ceratoides* (Heklau 2006) is a contribution to stability of nomenclature in this group of chenopodiaceous genera, in accordance with Art. 14 of the ICBN.

In the last report of the nomenclature committee for vascular plants (Brummitt 2009: 282), the proposal to conserve *Krascheninnikovia* was recommended by the committee.

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