

Lamarck's new species of Mesembryanthemaceae and the types of their names

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ABSTRACT

The holotype of *Mesembryanthemum echinatum* Lam. is an unpublished, sketchy drawing kept in the Lamarck herbarium (P-LAM). The holotype of the name *M. vaginatum* Lam., which has not been taken up again since its original publication, is also in P-LAM. That name has priority over *M. ciliatum* Aiton, pertaining to a species currently placed in *Brownanthus*. Two new combinations are proposed: *Brownanthus vaginatus* (Lam.) Chesselet & M.Pignal and *Brownanthus vaginatus* subsp. *schenkii* (Schinz) Chesselet & M.Pignal.

INTRODUCTION

The French naturalist Jean Baptiste de Monnet de Lamarck (1744–1829) established the first evolutionary synthesis of modern biology and participated in the great debates about living species and evolution of life that took place in late 18th century Europe (Corsi 2001). Lamarck's interests covered diverse topics including botany, chemistry, meteorology, and notably zoology, where he made the fundamental distinction between vertebrates and invertebrates, his contribution to botany is voluminous. In the *Flore française* (1779), Lamarck used the principle of dichotomous sorting for the identification of all taxa, thereby enabling identification to species level, a technique now widely used by botanists. In the *Encyclopédie méthodique*, he described numerous new species, but in the Mesembryanthemaceae only two. These are the topic of this contribution.

The *Encyclopédie méthodique*, published between 1783 and 1808, comprises eight volumes plus supplements. The two first volumes, and the third up to the letter P, are entirely the work of Lamarck. Many of the plants described there correspond to specimens kept in the Lamarck Herbarium (P-LAM). This valuable historic collection is rich in types and comprises ± 19 000 specimens. An Internet site dedicated to the works and contributions of Lamarck (www.lamarck.net) provides digitized images of the first 7 000 specimens, and the others too, are being made progressively available there and through the SONNERAT database (<http://www.mnhn.fr/base/sonnerat.html>). The Lamarck herbarium changed hands several times: it was sold, towards the end of Lamarck's life, to the German Botanist Johannes Roepert (the first to use floral diagrams), then bought by the University of Rostock in Germany and finally acquired, in 1886, by the Muséum of Paris. The collection is now housed not far from its origin in the house of Buffon

where Lamarck had his office at the Jardin des Plantes (Aymonin 1980, 1981).

Lamarck, in the section on Ficoïde, described two new mesemb species in the *Encyclopédie* (1788: 478): *Mesembryanthemum echinatum* Lam., a distinctive species, and the oldest name in the genus *Delosperma* N.E.Br., and *Mesembryanthemum vaginatum* Lam. the first validly published name that applies to a species currently in the genus *Brownanthus* Schwantes.

Mesembryanthemum echinatum Lam.

In the case of *M. echinatum*, a mix-up due to the re-assembly of the Lamarck collection has engendered confusion. In addition to being moved several times, the Lamarck herbarium was included into and later separated from the general herbarium at Rostock (the latter process taking no less than five years: see Aymonin 1981). Lamarck did not wish specimens to be glued as he preferred to observe the plants from all angles. His original herbarium consisted of unmounted specimens of dried plants with loose labels in species covers. They were mounted subsequently when Edmond Bonnet, curator of the herbarium at the Muséum, was given the task of re-arranging the Lamarck collection in 1900. Bonnet first had the specimens attached with paper strips and, for its arrangement, adopted the order of Durant (that largely follows the system of Bentham and Hooker). Lamarck preferred an arrangement that reflected natural relationships to an alphabetical system such as that of Linnaeus. The consequences of keeping the plants unmounted would not have been too serious had the herbarium been kept in Paris, such as those of the Jussieu (P-JU), acquired by the Muséum in 1857 after the death of Adrien de Jussieu, and that of Michel Adanson (1727–1806), donated to the Paris herbarium in 1924. Fixing of specimens of the Jussieu herbarium with pins and strips is thought to have taken place in the mid-19th century but the fixing of specimens with sticky strips took place much later in the history of this herbarium.

The name *Mesembryanthemum echinatum* was published by Lamarck (1788) where the species was described and qualified as v.v. (*vu vivant*, or *vidi vivum*), to

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indicate that the description was based on live material grown at the Jardin des Plantes. The species, currently in *Delosperma* N.E.Br., has been the subject of past debate (Taylor & Egli 1986). The combination in *Delosperma* was made by Schwantes (1927) who gave the basionym as '*M. echinatum* Ait.' (Aiton 1789). However, Lamarck's name was published one year earlier in 1788 [not 1786 as stated by Taylor & Egli (1986), see Stafleu & Cowan (1979)]. In his book on succulent plants, Candolle (1799) suggested that the material from which Lamarck's description was made, originated from the

Cape of Good Hope and was brought to Britain by Francis Masson in 1774, from where it came to the Jardin des Plantes. It is possible that Aiton's concept of *M. echinatum* was based on material of the same origin as Lamarck's plant, although this cannot be shown unequivocally.

What was still a debatable issue in 1986 has since been clarified by a new provision in the ICBN (Greuter *et al.* 2000, Art. 33.6(a)): even though Schwantes, in publishing the combination *Delosperma echinatum*, refer-

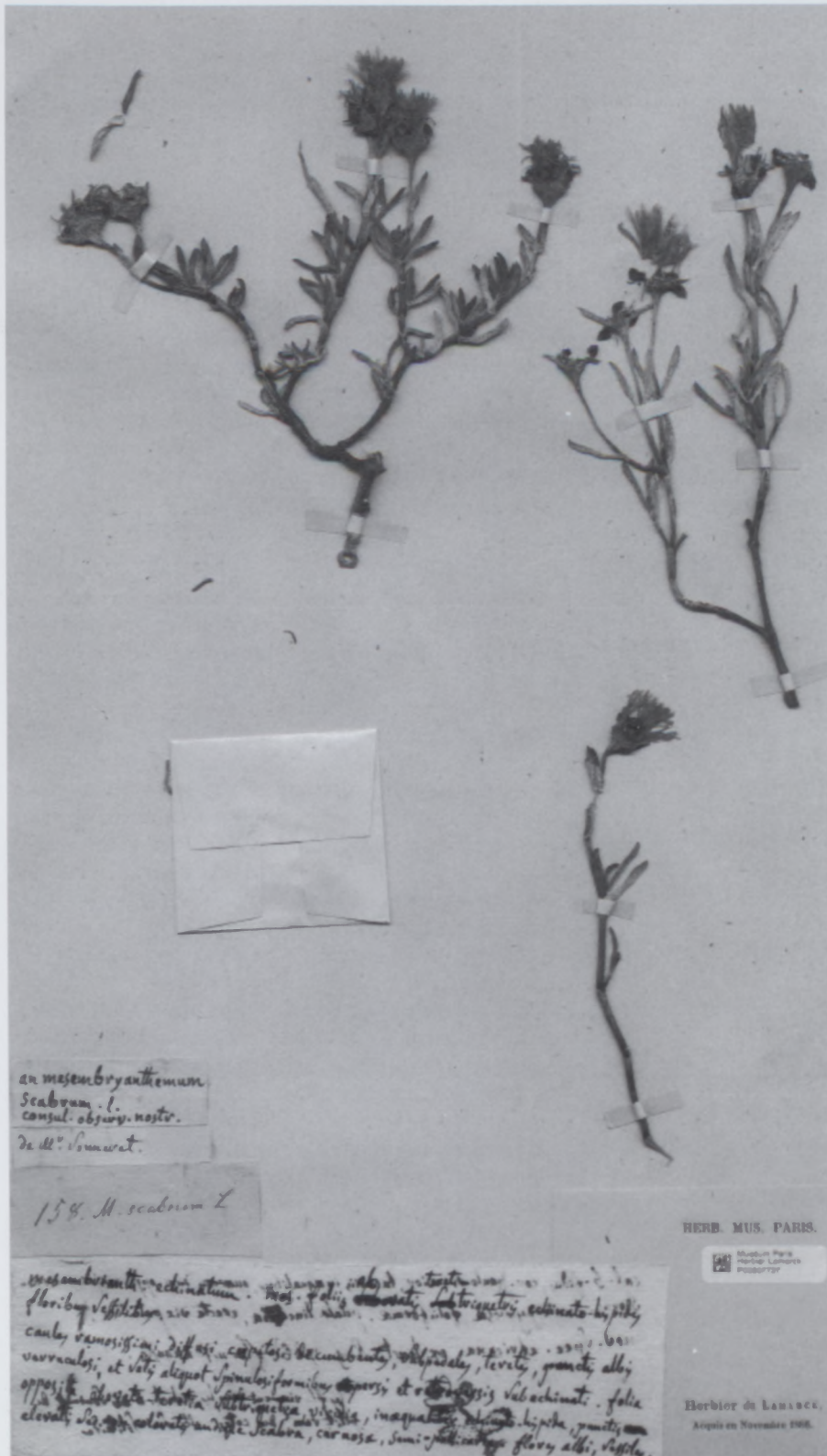


FIGURE 1.—Herbarium sheet from the Lamarck Herbarium of *Mesembryanthemum scabrum* showing appended description and drawing of *Delosperma* (*Mesembryanthemum*) *echinatum*.

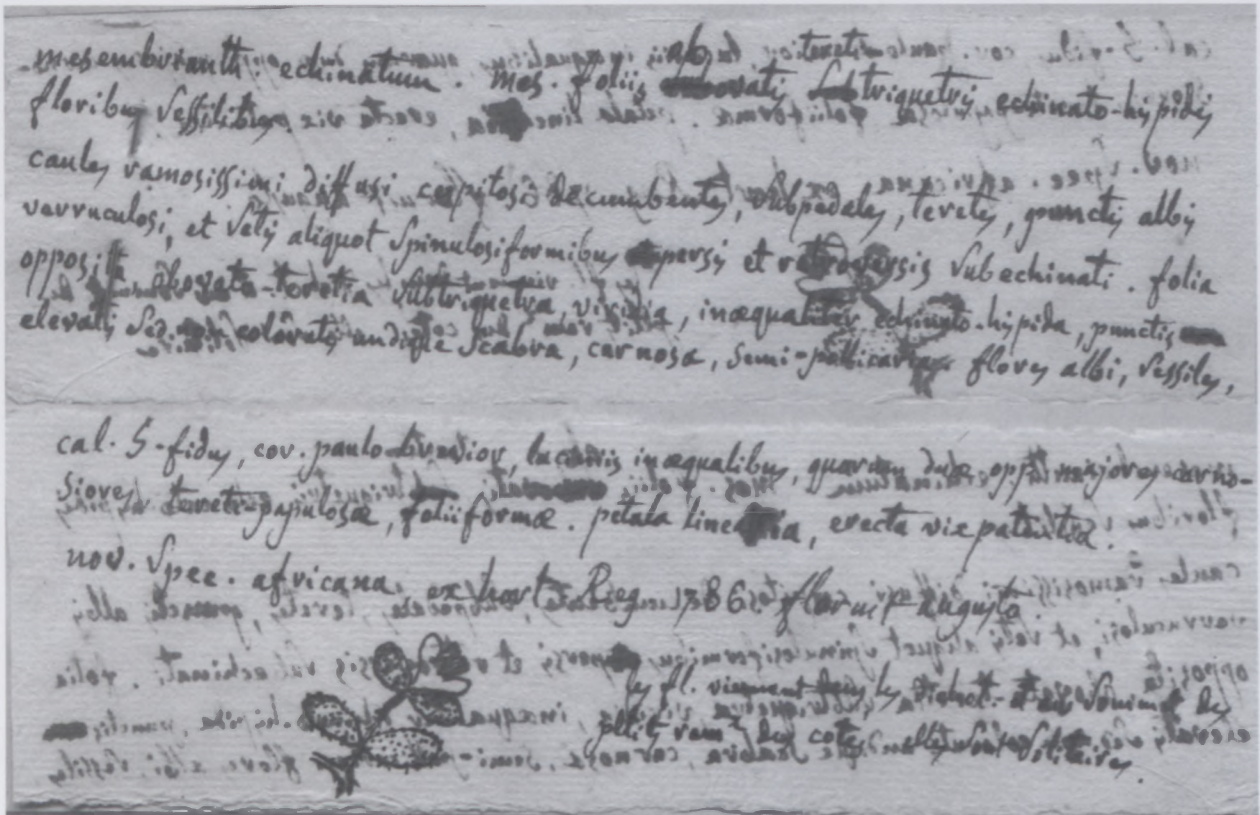


FIGURE 2.—Holotype of *Mesembryanthemum echinatum* Lam. including description and sketch. 'mesembrianth. echinatum floribus sessilibus. mes. foliis obovatis, tereti-triquetris, echinato-hispidis. Caules ramosissimi diffusi caespitosis decumbentes, subpedales, teretes, punctis albis verruculosi, et setis aliquot spinulosiformibus, aspersis et retroversis subechinati. Folia opposita, obovato-teretia subtriquetra, viridia, inaequaliter echinato-hispida, punctis elevatis sed non coloratis undique scabra, carnosae, semi-pollicariae. flores albi sessiles, cal. 5-fidus, cor. paulo brevior, laciniis inaequalibus, quarum dux opp. majores carnosiores, tereti-papulosae, foliiformae. Petala linearia, erecta vix patentia. nov. spec. africana, ex hort. Reg. 1786. floruit augusto. les fl. viennent dans les dichot. et au sommet des petits ram. des cotés. Elles sont solitaires.' Translates as: 'Mesembryanthemum echinatum with sessile flowers. Mesembryanthemum with leaves obovate, terete-triquetrous, echinate-hispid. Stems highly branched diffuse caespitose decumbent, of about 1 foot long [30 cm] terete, subechinate white verruculose dots, and sometimes setae spinulose, rugose sparse reflexed. Leaves opposite, obovate-terete almost triquetrous green, unequally echinate-hispid with elevated dots but not coloured everywhere, scabrid, fleshy, half an inch long [1.25 cm]. Flowers white, sessile, calyx 5-partite, a little shorter than the corolla, the lobes unequal of which two opposite ones are longer and fleshy, terete papillose and leaf-shaped. Petals linear, erect, hardly spreading. New African species from the royal garden. 1786, Flowered in August. The flowers come in the dicots and at the summit of small branches on the sides. They are solitary.'

red to the wrong basionym author, Aiton; and even though Aiton did not mention Lamarck's earlier validation of *Mesembryanthemum echinatum*, of which he may have been unaware; still Lamarck is to be considered as the basionym author, and the correct author citation for the combination in *Delosperma* is *D. echinatum* (Lam.) Schwantes.

As no original specimens of *M. echinatum* are extant, Taylor & Egli (1986) designated a photograph of Schwantes (1927) as neotype, and this neotypification was accepted by Hartmann (2001a). However, an original element is extant in the Lamarck herbarium, an illustration which (in the absence of a preserved specimen of the living plant) must be accepted as the holotype. Therefore, the designated neotype has no standing.

Although Taylor & Egli (1986) consulted a microfiche of the herbarium sheet represented in Figure 1, they failed to realize the true significance of the relevant slip of paper (Figure 2). What Taylor & Egli (1986) interpreted as a misidentification is in fact the result of the complex history of Lamarck's herbarium. When the collection was finally pasted to herbarium sheets, a small

piece of paper with the description and sketch of *M. echinatum*, by Lamarck, became associated with the wrong herbarium specimen, of *Lampranthus scaber* (L.) N.E.Br. (= *Mesembryanthemum scabrum* L.) (Figure 1). It is possible that the word *scabra* in the description of *M. echinatum* prompted the association of the note with that specimen.

Lamarck's slip obviously dates back to the time when the protologue was written. Along with the description, it includes a sketch of the plant itself, which is original material for the name as defined in the ICBN (Art. 9 Note 2). Although very simple, this illustration agrees with *D. echinatum* as currently understood, a highly distinctive mesemb with echinate leaves and sessile flowers, unique and atypical in the genus as pointed out by Koutnik & O'Connor-Fenton (1985). As no other original material is known to exist, we consider Lamarck's original sketch of *M. echinatum* as the holotype of the name (Figure 2). The associated description begins with the phrase-name provided by Lamarck in the protologue. It reads: '*Mesembryanthemum echinatum. Mesembryanthemum foliis obovatis tereti-triquetris verruculosis echinato-hispidis, floribus sessilibus*'. The type illus-

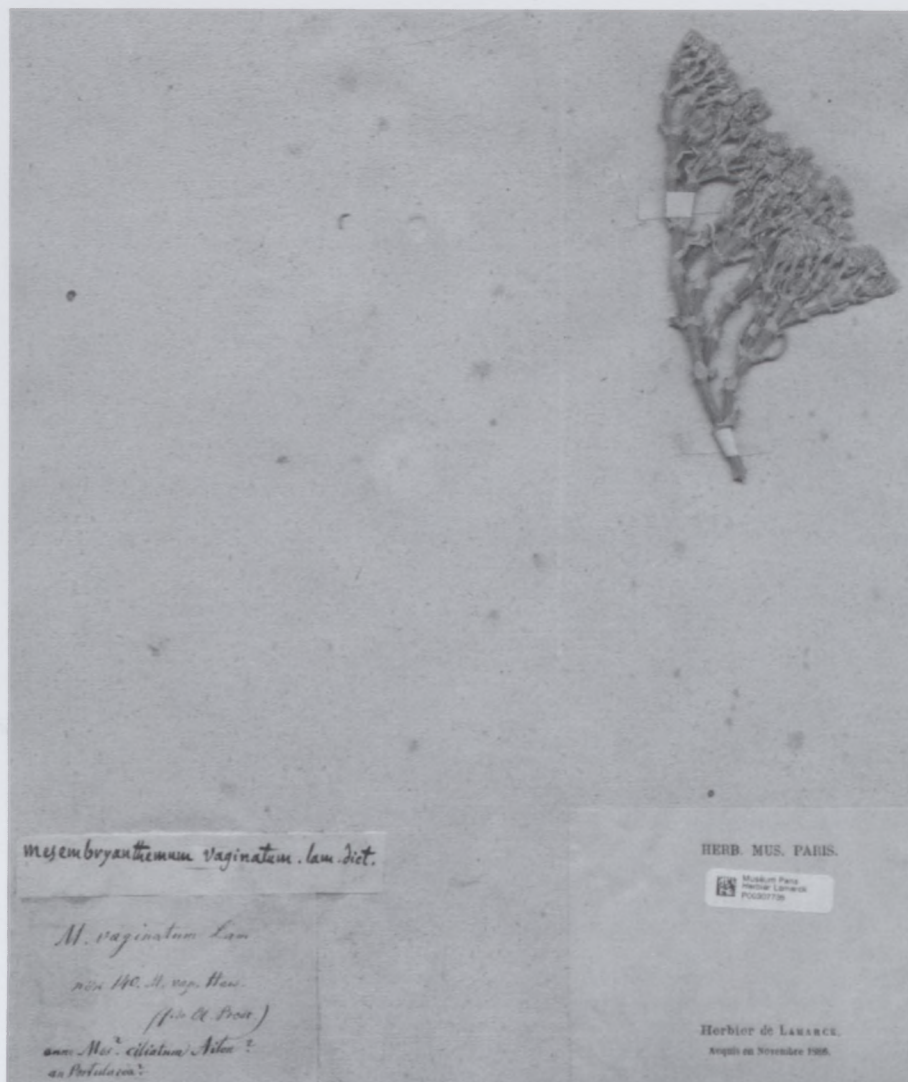


FIGURE 3.—Holotype of *Mesembryanthemum vaginatum* Lam.

tration, in the Lamarck herbarium in Paris (P-LAM), is attached to the specimen of *M. scabrum* bar-coded as P00307737.

Mesembryanthemum vaginatum Lam.

The second new mesemb species described by Lamarck (1788) is *Mesembryanthemum vaginatum*, with the accompanying phrase-name: '*Mesembryanthemum foliis oppositis basi connato-vaginantibus, vaginis persistentibus crebris inferne barbatis, floribus corymbosis*'. This validating diagnosis is followed by the indication '(v.s.)' [*vu sec.*, or *vidi siccum*], meaning that herbarium material was available for study. The corresponding specimen in P-LAM (Figure 3) was brought to Paris from the Cape of Good Hope by Pierre Sonnerat, the French naturalist and draughtsman who visited the Cape in the late 18th century, but is known for his work on the Seychelles, India, the East Indies and China (Gunn & Codd 1981). His specimens were mainly presented to Jussieu and Lamarck, in Paris.

The specimen held in the Lamarck herbarium (P-LAM, bar code P00307735) is considered to be the holotype of *M. vaginatum* Lam. The re-discovery of this type specimen has nomenclatural implications. In modern literature the species represented by that type is known as

Brownanthus ciliatus (Aiton) Schwantes, with the basionym, *M. ciliatum*, validated by Aiton (Gerbaulet & Pierce in Hartmann 2001a). Aiton lists the 'Ciliated Fig Marigold' in *Hortus kewensis* (1789) with the phrase-name: '*M. foliis oppositis connatis semiteretibus, stipulis membranaceis reflexis laceris ciliiformibus*'. Aiton's material was introduced to Britain by Francis Masson in 1774. A drawing by Masson (BM) has been designated by Gerbaulet & Pierce (in Hartmann 2001a) as the lectotype of the name *M. ciliatum*. In De Candolle's (1828) treatment of the 'Ficoideæ', *M. ciliatum* Aiton is cited under *species non satis notæ*.

There is a second, later *Mesembryanthemum vaginatum*, by Haworth (1803), which in the original volume of *Index kewensis* is unaccountably treated as if it were but a mere later re-use of *M. vaginatum* Lam. In reality, it is an independent, illegitimate later homonym that belongs to a completely different species. In De Candolle (1828), *Mesembryanthemum vaginatum* Haw. is correctly listed among the taxa currently placed in the genus *Ruschia* Schwantes, with a reference to 'Haw. misc. 95. syn. 284. excl. var. β rev. 127. non. Lam.'. It bears the legitimate name *Ruschia vaginata* Schwantes (with priority dating from 1927, not 1789: see ICBN Art. 58). The neotype designation by Hartmann (2001b) is effective for both *Mesembryanthemum vaginatum* Haw. and the homotypic *Ruschia vaginata* Schwantes.

Lamarck's name is not accounted for elsewhere in De Candolle's work, and is now utterly forgotten. We have considered the option of submitting a proposal to conserve the name *M. ciliatum* Aiton against it, in the interest of stability of botanical nomenclature. We are, however, discarding that option and proposing a name change for nomenclatural reasons. Although the continued use of the name *Brownanthus ciliatus* (Aiton) Schwantes may be preferred for practical reasons, it is not proposed here as the species is little known, unimportant in horticultural trade, only occurs in Northern and Western Cape, and the name is scantily used in the literature. The application of the rule of priority requires the following nomenclatural changes:

***Brownanthus vaginatus* (Lam.) Chesselet & M.Pignal, comb. nov.**

Mesembryanthemum vaginatum Lam.: 478 (1788). Type: *Sonnerat s.n.* (P-LAM!, holo. P00307735). *M. ciliatum* Aiton: 179 (1789). *Trichocyclus ciliatus* (Aiton) N.E.Br.: 151 (1923). *Brownanthus ciliatus* (Aiton) Schwantes: 21 (1927). *Psilocaulon ciliatum* (Aiton) Friedrich: 216 (1968).

***Brownanthus vaginatus* subsp. *schenckii* (Schinz) Chesselet & M.Pignal, comb. nov.**

Mesembryanthemum schenckii Schinz: 80 (1897). *Trichocyclus simplex* N.E.Br. ex Maass: 234 (1928). *T. schenckii* (Schinz) Dinter & Schwantes ex Range: 18 (1934). *Brownanthus simplex* (N.E.Br. ex Maass) Bullock: 494 (1937). *B. ciliatus* subsp. *schenckii* (Schinz) Ihlenf. & Bittrich: 316 (1985). *B. schenckii* (Schinz) Schwantes: 21 (1927). Lectotype: (following Gerbault & Pierce in Hartmann 2001a) *Schenck 174* (K).

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