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ADELOCARYUM BRAND AND BRANDELLA R. MILL (BORAGINACEAE)

H. RIEDL, Wien

The genus *Adelocaryum* BRAND (1915a) has been created originally to include five species, *A. anchusoides* (LINDLEY) BRAND, *A. capusii* (FRANCHET) BRAND, *A. schlagintweitii* BRAND, *A. coelestinum* (LINDLEY) BRAND and *A. malabaricum* (C.B. CLARKE) BRAND. In the same year, BRAND (1915b) described a new species, *A. flexuosum* BRAND, and in 1921 *A. erythraeum* BRAND. The genus should have its place between *Cynoglossum* LINNAEUS and *Lindelofia* LEHMANN. The principal distinguishing characters should be the small attachment scar comparable to that of *Cynoglossum* combined with longer, more or less distinctly sagittate anthers on short filaments. While the type species of *Cynoglossum* is unambiguous - *C. officinale* LINNAEUS - *Lindelofia* and *Adelocaryum* are open to discussion.

LEHMANN (1850) mentioned two species in his original publication of *Lindelofia*, *L. spectabilis* LEHMANN and *L. anchusoides* (LINDLEY) LEHMANN. As already mentioned, the latter was removed from *Lindelofia* to his new genus *Adelocaryum* by BRAND, so that the only remaining species of the original two recognized by him as true *Lindelofia* was *L. spectabilis*, now generally accepted as a synonym of *L. longiflora* (BENTHAM) BAILLON. There is no reason why it should not be accepted as the type of the genus, and accordingly it was designated as such by the present author (RIEDL 1967, p. 137). Neither the authors of "Index Nominum Genericorum", who stated that no type had been designated as yet in 1979, nor SADAT (1989) mention this fact. SADAT, unfortunately, chose *L. anchusoides* as the lectotype without giving any reason why she had not followed the earlier choice. As far as I can see, this later designation is invalid, therefore.

MILL (1986) maintained that I had provisionally (in italics!) selected

Lindelofia anchusoides as the lectotype of *Adelocaryum* (RIEDL 1962), taking herewith a "logical but taxonomically unsound course". Obviously, his incomplete knowledge of the German language prevented him from catching my full meaning. I had not selected a lectotype at all, either provisionally (which would not count from the nomenclatural point of view) or definitely. I had only supposed that it would be the proper course to take the first mentioned species, *L. anchusoides*, as the lectotype as a point for discussion without actually proposing to do so ("Die erstgenannte Art, die wohl als Typus der Gattung zu betrachten ist ..."). In a later paper on *Adelocaryum* (RIEDL 1971). I did not argue about typification at all. POPOV (1953) already had mentioned, that *Adelocaryum anchusoides* or *A. coelestinum* offered themselves as types of *Adelocaryum* BRAND but that he himself preferred the latter, as in this case the generic name could be saved and not merged into synonymy of *Lindelofia*. In 1971, RIEDL placed *A. anchusoides* and *A. capusii* in *Lindelofia*, the remaining species in *Cynoglossum*, partly as new combinations. *Adelocaryum erythraeum* BRAND (1921) was transferred to a new monotypic genus *Brandella* by MILL (1986) on what seem to me fairly reasonable arguments for separation from *Cynoglossum*. The most important character is the comparatively thick, incurved wing of the nutlets bearing glochids on its surface, which are lacking in true *Cynoglossum*. Against the use of the name *Adelocaryum* he argues "... it being impossible to retain the name *Adelocaryum* owing to the exclusion from that genus of all species in Brand's original protologue". Obviously, he did not know *Cynoglossum coelestinum* and *C. malabaricum*, or he would have noticed that both these species show just the same characters very clearly, though BRAND had used different words to describe them. It is not quite true, moreover, that spines are always lacking from the surface of the wing in *Paracaryum* or at least in what is now regarded as a separate genus *Microparacaryum* (M. POPOV ex H. RIEDL) H.H. HILGER et D. PODLECH by some authors, but certainly they do not form a regular feature. At any rate, their presence precludes my own previous morphological interpretation of the wing in *C. coelestinum* (RIEDL 1962). Morphology of the wing-like margin will be discussed later in this paper.

The facts mentioned lead to the following taxonomic and nomenclatural consequences: The generic name *Adelocaryum* BRAND lectotypified with *Cynoglossum coelestinum* LINDLEY is still valid, as two of BRAND's original species, the type and *A. malabaricum*, belong to that genus. A.

flexuosum and *A. schlagintweitii* are certainly members of *Cynoglossum*. The remaining two species, *A. anchusoides* and *A. capusii*, have to be transferred to *Lindelofia* with the type species *Lindelofia longiflora* (= *L. spectabilis*). True *Adelocaryum* is certainly different from *Cynoglossum* in the particular morphology of the wing-like margin of their nutlets and its three species are closely related to each other.

Adelocaryum BRAND in FEDDE, Repertorium specierum novarum 13: 547 (1915)

Syn.: *Brandella* R. MILL, Notes of the Royal Botanic Garden Edinburgh 43: 478 (1986)

Lectotype: *Cynoglossum coelestinum* LINDLEY

Descriptio emendata: Habitu similis speciebus generis *Cynoglossi* et generum affinium. A *Cynoglosso* differt margine in modo alae evoluta incurvato in facie exteriore glochidia vel spinas gerente, e basibus confluentibus glochidiorum marginalium non constituto; a genere *Lindelofia* iisdem characteribus, praeterea filamentis brevioribus, antheris non vel vix fornices superantibus, pro latitudine brevioribus ideoque inter *Lindelofiam* et *Cynoglossum* intermediis, areola nuclearum ut in *Cynoglosso* minore. Ala nuclearum generis *Paracaryi* BOISSIER a disco distincte separata, nec e margine evoluta eoque continua ut in *Adelocaryo*, praeterea areola maior.

Similar in general habit to *Cynoglossum* and related genera and closely resembling them also in the morphology of fruit and flower. Different from *Cynoglossum* in the wing-like, incurved margin of the nutlets bearing glochids or spines on its surface and not derived from the confluent bases of marginal glochids, from *Lindelofia* apart from these characters in the shorter filaments and anthers not or scarcely surpassing the faucal appendages in length and the smaller attachment scar of the nutlets. In the ratio of length, to width of the anthers it is usually intermediate between these two genera. In *Paracaryum* with winged nutlets, the wing is sharply separated from the disc and not part of the margin and continuous with it as in *Adelocaryum*.

Distribution: Ethiopia, southern part of Saudi-Arabia, south-western part of Deccan Peninsula.

The nutlets of *Adelocaryum* are cup- or bowl-shaped not because they have an incurved wing as an outgrowth of their margin comparable to the sum of marginal glochids or anything like that but because their margin

is outgrowing itself. It is morphologically comparable to the tumidulous margin in some *Cynoglossum* species like *C. officinale*, and even more similar to that of *Pardoglossum*. It is not justified, therefore, to call it a wing, and MILL quite correctly described it as "wing-like". This is especially obvious in *A. malabaricum*, where there are radiating wrinkles on the outside of the nutlet that are continuous to the very edge. The small glochids likewise are evenly distributed all over the outer surface whether plain or incurved and flattened. In at least two of the three species the wing-like, incurved margin is also tougher than, for instance, the wing of *Paracaryum* species. This is contrary to my own previous statement (RIEDL 1962) but I had to revise my opinion on repeated examination. In *Cynoglossum coelestinum* = *Adelocaryum coelestinum* which I had described in 1962, these facts are not as easily recognizable as in the other two species, but can nevertheless be found when once known from the others.

The geographical distribution of the small genus follows a widespread pattern. The Arabian peninsula often acts as a stepping stone from north-eastern Africa to the Deccan peninsula. The term coined by EIG (1931) for this type of distribution, "Sudano-Deccanian", is misleading as pointed out by BURTT (1971).

Key to the species

- 1a Inflorescence loose, usually with a few small leaves in its lower part. Lower pedicels longer than the fruiting calyx. Basal leaves (of the first year) not cordate at base 3. *A. erythraeum*
- 1b Inflorescence not so loose at least in its upper part, always without leaves. All the pedicels shorter than the calyx at fruiting time. Basal leaves (of the first year) cordate or broadly truncate at base 2
- 2a Corolla 4 - 5 mm long, limb rotate. Flowers loosely arranged in lower part of the few, ± divaricate branches of the inflorescence, crowded in the upper 1. *A. coelestinum*
- 2b Corolla 7 - 8 mm long, limb campanulate. Flowers more or less equally distributed in the nearly parallel, densely crowded branches of the inflorescence 2. *A. malabaricum*

1. *Adelocaryum coelestinum* (LINDLEY) BRAND in FEDDES Repert. spec. nov. 13: 549 (1915)

Syn.: *Cynoglossum coelestinum* LINDLEY, Botanical Register 25, t. 36 (1839)

Echinosperrum coelestinum (LINDLEY) WIGHT, Icones Florae Indiae orientalis IV, t. 1394 (1850)

Paracaryum coelestinum (LINDLEY) BENTHAM et HOOKER, Genera plantarum II: 850 (1876)

Biennial, often with several stems ascending from the base, 30 - 70 cm high. Stems angulate, glabrescent in the lower part, covered by short, retrorse, soft hairs in the upper, branched above the middle. Basal leaves absent at flowering time, stalked, with cordate base, covered by evenly distributed, slightly antrorse, very short, appressed, conical hairs on the upper, along the nerves and the margin also on the lower side, sometimes with more slender, appressed hairs between the nerves on the lower side. Hairs of stem-leaves corresponding in quality and distribution to those of the basal leaves. Lowermost stem-leaves lanceolate, tapering gradually into a stalk decreasing in length from the base upwards, drying and breaking away soon, leaving remains of the stalk. Middle and upper stem-leaves ovate to ovate-oblong or oblong-lanceolate, sessile with broad base sometimes partly embracing the stem, pointed at apex, 2,5 - 10 cm long, = 0,8 - 5 cm wide. Nervature of all leaves scarcely visible on the upper side, much more distinct on the lower due to the very dense white hairs, forming a network in most specimens. Inflorescences on lateral branches in the axils of the uppermost leaves, sometimes shorter branches already lower down, terminal inflorescence forked. Inflorescence first dense, whorled, subcapitate on naked peduncles, at a later stage elongate, straightening out, loose in the lower part. Pedicels 0,5 - 1,5 mm long in flower, (1 -)2 - 5 mm in fruit, sometimes curved downwards at last. Calyx 1,5(- 2) mm long in flower, elongated to 4 (- 4,5) mm in fruit, cleft into five lanceolate to lanceolate-ovate lobes nearly to the base, lobes hairy along the margin, sometimes with a few hairs also on the surface. Eventually, the 2 - 3 uppermost flowers of the inflorescence and also their calyx are much smaller than the rest. Corolla blue, 4 - 5 mm long, rotate, tube 3 - 3,5 mm long, limb upto 10 - 12 mm in diameter. Faucal appendages a little longer than wide, involute and emarginate at apex. Stamens inserted at nearly the same level as the faucal appendages, with short, but distinct filaments a little more than half as long as the anthers, anthers about

twice as long as wide. Nutlets 4, about 6 mm long, 4 - 4,5 mm wide, with an incurved, wing-like margin wrinkled radially outside, bearing a few short glochids on surface and along edge, centre smooth. Style 2 - 3 mm long, stigma indistinct..

Gen. distribution: South-western India.

Type: cultivated from seeds received from J. Nimmo (Bombay) by the Royal Horticultural society.

Specimens examined: Asia. Huegel 1970, 2137; Malabar, Concan, etc. Regio tropica. Herb. Indiae orient. Hooker f. et Thomson s.n., coll. Stocks, Law, etc.; Kangra-Chamba 1853, leg. Jameson s.n.

2. *Adelocaryum malabaricum* (C.B. CLARKE) BRAND, FEDDES Repert. spec. nov. 13: 549 (1815)

Syn.: *Paracaryum malabaricum* C.B. CLARKE in HOOKER f., Flora of British India IV. 160 (1883)

Cynoglossum malabaricum (C.B. CLARKE) H. RIEDL, Österreichische Botanische Zeitschrift 119: 71 (1971)

Stout plant. Base not seen. Stems 5 mm or more in diameter, + angulate, densely covered by short, scabridulous hairs, branched only in the uppermost part. Basal leaves with a long stalk (at least 8 - 15 cm), broadly cordate, long acuminate, 7 - 8 cm long and wide, with a very characteristic nervature of nearly concentric primary nerves and short secondary nerves acting as anastomoses between them. Stem leaves 3 - 9 cm long, 1 - 4,2 cm wide, often with crispulate margin, broadly ovate to ovate-lanceolate, acute to acuminate, densely covered by short, scabrid white hairs on a calcareous, bulbous base on the upper, only along the nerves on the lower side, nervature as described for the basal leaves, strongly prominent on the lower, impressed on the upper side, lower stem-leaves shortly stalked, upper ones sessile to semi-amplexicaulous. Inflorescences crowded at apex, subcapitate first, elongate and straightened afterwards, forming a dense cluster of parallel, usually forked branches. Pedicels upto 1 mm long in flower, 1 - 2,5(- 3) mm in fruit, densely hairy, lower ones often curved downwards at last. Calyx 3 - 3,5 mm long in flower, 5 - 6,5 mm in fruit, cleft to the base into 5 lanceolate to ovate-lanceolate, acute lobes densely hairy along the margins and usually also on the surface. Corolla 7 - 8 (10 - 11 according to BRAND, 1921) mm long, limb about as long as tube, campanulate, divided to the middle into 5 broadly rounded lobes. Faucal appendages

about as long as wide. Stamens inserted at the same level as the appendages. Nutlets 4, about 6 - 7 mm long, 4 - 4,5 mm wide, centre smooth, wing-like margin densely covered with very short glochids on the outer side just as central part. Style about 3 - 3,5 mm long, stigma indistinct.

Gen. distribution: South-western India.

Type: Western Deccan Peninsula: Canara and Mysore, leg. Law. Herbarium Indiae orientalis Hooker f. et Thomsom sub *Cynoglossum* sp. 13 (K, iso-W!)

Further specimen examined: Asia. Huegel 3024.

3. *Adelocaryum erythraeum* BRAND in A. ENGLER, Das Pflanzenreich IV. 252. *Borraginaceae - Borragninoideae - Cynoglosseae* p. 78 (1921)
Syn.: *Cynoglossum erythraeum* (BRAND) H. RIEDL, Österreichische Botanische Zeitschrift 119: 71 (1971)
Brandella erythraea (BRAND) R. MILL, Notes Royal Botanic Garden Edinburgh 43: 478 (1986)

Annual (or biennial?), 20 - 70 cm high. Stems at their base clothed by dry remains of lowermost leaves, branched throughout their length, covered with spreading, crispulate hairs. Basal leaves not seen, but from their remains certainly not cordate. Stem-leaves sessile, 1,5 - 7 cm long, 0,4 - 1,5 cm wide, covered with rigid, more or less spreading hairs with usually slightly bulbous base at both sides more or less equally, lanceolate to oblong-obovate, acute or obtuse, gradually tapering towards base. Inflorescences axillar and terminal, few-flowered, lax, sometimes with a few leaves in their lower part. Lowermost pedicels 8 - 10 mm in fruit, sometimes slightly curved downwards, decreasing in length towards apex. Calyx 2,5 - 3 mm long, cleft into 5 lanceolate, acute lobes covered by spreading hairs nearly to the base. Corolla campanulate, 3 - 4 mm long, limb as long as tube, with broadly rounded lobes. Faucal appendages wider than long, nearly semilunar. Stamens inserted slightly below base of faucal appendages. Style short, about 1 mm, with a small, discoid stigma. Nutlets 4, broadly ovate in outline, 3 - 5 mm long, 2,5 - 4 mm wide; in respect to the marginal wing two different types of nutlets occur on different individuals: the wing ist either strongly incurved with very short glochids often on bullate outgrowths outside, or narrow, saucer-shaped, with long, flattened glochids on its very edge, scarcely glochidiate

outside; disc densely covered with short, slender glochids.

General distribution: Ethiopia (confined to Eritrea), southern Sudan, southern part of Saudi-Arabia.

Lectotype: Eritraea, upper part of Mogod valley, 1400 m, 8.4.1892. Schweinfurth & Riva 1594 (G!). Co-type: Eritraea, East of Amba-Tokhän, 398 m, 27.2.1892. Schweinfurth & Riva 615 (G).

The difference between *Adelocaryum erythraeum* BRAND and the other two species of the genus is the same as that between genus *Paracaryum* s.str. and subgenus *Microparacaryum* M. POPOV ex H. RIEDL that was raised to the rank of genus by H. HILGER and D. PODLECH. In the present author's opinion separation on the generic level is not appropriate, but there is no doubt that we deal with natural entities independent from the rank assigned to them. If one prefers to regard *Microparacaryum* as a genus, it is necessary also to separate *Brandella* MILL from *Adelocaryum*. In both cases we have annual species on one, biennial to perennial species on the other side. The annual species are characterized by heteromerocarpy as described in detail by HILGER & al. (1985). The type of *Adelocaryum erythraeum* is characterized by a wide, incurved margin and can be called *A. erythraeum* BRAND forma *erythraeum*, the plants with narrow marginal wing and long flattened glochids represent forma *subexalata* H. RIEDL, f o r m a n o v a : nuculae ala angustissima subexplanata in margine glochidiata cinctae.

Holotypus: Abyssinia, Dschadscha (6000'). 29. Octobre 1854. Schimper 362 (sub *Echinosperrum latifolium* HOCHST.; FI!). The local name Dannak is the same as for *Cynoglossopsis latifolia* or *Cynoglossum lanceolatum*.

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