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Taxonomic history of *Didymocarpus* and *Henckelia* (Gesneriaceae)

By B. L. Burtt

Royal Botanic Garden Edinburgh, Scotland, U.K.

Keywords: Gesneriaceae, *Didymocarpus, Henckelia.* – Taxonomic history.

Abstract

The early taxonomic history of the genera *Didymocarpus* Wall. and *Henckelia* Spreng. (*Rottlera* Vahl non Willd.) is intimately connected with the early exploration of Indian and S. E. Asian plants and the collaboration between N. Wallich and W. Jack. This is in contrast to the lack of contact with workers on the continent, notably with Sprengel. The excessive extension of *Didymocarpus* to include not only *Henckelia* and numerous species from tropical Malesia, but even *Chirita* D. Don, is recorded. The paper concludes by noting current proposals for the redefinition of *Didymocarpus* and the recognition of *Henckelia* as an independent genus for the species of S. India and most of those from tropical Malesia, including *Loxocarpus* R. Br., *Codonoboea* Ridl. and *Platyadenia* B. L. Burtt, which have sometimes been segregated.

Zusammenfassung

Die frühe taxonomische Geschichte der Gattungen *Didymocarpus* Wall. und *Henckelia* Spreng. (*Rottlera* Vahl non Willd.) ist eng verknüpft mit der beginnenden Erforschung der indischen und südostasiatischen Flora. Im Gegensatz zur Zusammenarbeit zwischen N. Wallich und W. Jack bestand kaum Kontakt mit kontinentaleuropäischen Botanikern, insbesondere mit Sprengel. Die Gattung *Didymocarpus* wurde in der Folge exzessiv erweitert und schloß nicht nur *Henckelia* und zahlreiche malesische Arten mit ein, sondern auch noch *Chirita* D. Don. Die Arbeit schließt mit einem Hinweis auf die vorgeschlagene Neufassung der Gattung *Didymocarpus* und die Wiedererrichtung der Gattung *Henckelia,* welche die südindischen und die Hauptmasse der malesischen Arten sowie die Gattungen *Loxocarpus* R. Br., *Codonoboea* Ridl. und *Platyadenia* B. L. Burtt umfaßt.

In the early years of the 19th century the missionary and botanist J. P. Rottler was working in India at the Danish station of Tranquebar, south of Madras. From there he sent to M. Vahl, Professor of Botany at Copen-

hagen, dried specimens of a plant that he had collected in the hills near Madura (9°55 N., 78°10 E.) and to which he attached the name *Gratiola montana*. On receiving this plant VAHL recognized it as a distinct genus and described it as *Röttlera* Vahl (1804); what reason he had for spelling the name with an umlaut over the *o* is unknown: it has been correctly transliterated as *oe* and the name has therefore appeared as *Roettlera* in the work of the few botanists who have used it. But elsewhere ROTTLER's name has always appeared without the umlaut and its seems best to correct VAHL's genus to *Rottlera* and WALLICH's specific name to *Didymocarpus rottlerianus*. VAHL changed ROTTLER's epithet *montana* to *incana*, in reference to the dense white woolly indumentum covering the leaves. However VAHL's generic name had been antedated by *Rottlera* Willd. (1797), a member of Euphorbiaceae (now *Trewia* L.). This duplication of names was remedied by K. J. P. SPRENGEL who substituted the name *Henckelia* Spreng. (1817), honouring L. V. F. HENCKEL VON DONNERSMARCK (1785 - 1861), a German administrator and amateur botanist. At that time only the original species was known, but SPRENGEL did not make the transfer *H. incana* (Vahl) Spreng. until some years later (SPRENGEL 1824).

Meanwhile in 1819 WALLICH's new genus *Didymocarpus* had appeared in a note published by Francis HAMILTON under the title "Notice of the Progress in Botanical Science in Bengal, being the substance of a letter from Dr. WALLICH, Superintendent of the Botanical Garden near Calcutta to Francis HAMILTON, M. D., F. R. S. & F. A. S. L. & E" (HAMILTON 1819). This article was written in part by HAMILTON himself, other parts are clearly extracts from WALLICH's letter. The Nepal plants about which WALLICH wrote had come from two sources, partly from two Indian collectors whom WALLICH had sent up specially to collect plants, and partly from Mr. E. GARDNER, the British Resident there, who also employed his own collectors. HAMILTON records the list of plants that WALLICH gave in his letter and at the end of this list is the first reference to *Didymocarpus*, as follows:

"Some species of a new genus of the Bignoniaceae, which Dr. Wallich intends calling Didymocarpus, and which is nearly allied to the Incarvillia, of which several species are also found near Kathmandu. This genus may be distinguished, Staminibus 2 sterilibus; ovario pseudo-quadriloculare; capsula lineari elongata pedicellata bipartibili; singula biloculari marginibus dehiscente; seminibus minutis nudis insertis valvularum interiorum marginibus liberis involutis; corollae labio superiore brevissimo inferiore elongato.

The plants of this genus have a considerable affinity to the genus Sesamum; are herbaceous, and somewhat fleshy, and are mostly covered with

short hairs, interspersed with minute resinous dots, occasioning a degree of viscidity. Their stem, when they have any, is generally undivided; the peduncles are slender; the flowers are generally showy, purple and very tender, which renders the examination of dried specimens very difficult: the plants abound in a resinous fragrant exudation, and among the natives are called by the generic name Kumkuma, yielding a drug of this name. Their primordial leaves dried, form the drug called Rani Govindhi. These drugs are in high esteem, and are used as a sacerdotal offering by the Brahmans, and also as a perfume by the Hindu ladies. Dr. Wallich has only been able to rear one species in the Botanical Garden: the others all died shortly after their introduction, the heat probably being too great."

It is to be noted that in the whole of HAMILTON's article there is no mention of WALLICH having sent any specimens. Indeed we know that it was LAMBERT who was receiving WALLICH's specimens at this time, specimens that were eventually included in the 'Prodromus Florae Nepalensis' by David DON (1825), who was curator of LAMBERT's herbarium. LAMBERT had already received HAMILTON's own collections from Nepal, as HAMILTON himself tells us in this article. It is clear, therefore, that the latin diagnosis of *Didymocarpus* published by HAMILTON must have been written by WALLICH himself: a full bibliographical citation should therefore read *Didymocarpus* Wallich in Hamilton (1819: 378); there is no reason to write 'ex Hamilton', thereby making HAMILTON the effective author.

The story now switches to William JACK, who received his medical training at Aberdeen and London, but had strong botanical leanings. He joined the Honourable East India Company in 1813 and soon after arrival in India was attached to the military units fighting in Nepal. JACK made some botanical collections and in 1815 entered into correspondence with WALLICH, who had just succeeded ROXBURGH at the Calcutta Botanic Garden. It was not for another three years that, in 1818, JACK was able to visit Calcutta. WALLICH invited JACK to stay with him and together they worked on Nepalese plants. Later that year Sir Stamford RAFFLES, governor of Sumatra (at that time in British hands), visited the Botanic Garden and met JACK. The outcome was that he offerred JACK the post of surgeon and botanist on his staff. JACK wanted nothing better and sailed with RAFFLES for Sumatra via Penang in December 1818. The stay at Penang was rather a protracted one, lasting till May 1819. This gave JACK the opportunity to collect the flora of the island and to make his entry into the history of *Didymocarpus*.

On February 12 1819 JACK (BURKILL 1916) wrote to WALLICH detailing notes on various plants he had found. *"I enclose some ripe capsules of a diandrous plant, habitu didynamioid, which has puzzled me a little. I*

most distinctly remember your Nepaul Koom Koom, which you referred to Incarvillea, but I think the capsules of this plant resemble it. The placentae are so peculiarly reflected, that they appear to be four celled; I have met with two or three species. It seems to have an affinity to Boea". This tells us that when JACK was working with WALLICH during the previous year, WALLICH had not yet finally decided to recognize the Nepalese plants as a new genus, *Didymocarpus*. The capsules that JACK sent with this letter must have been those of either *Didymocarpus reptans* Jack or *D. crinitus* Jack, the two diandrous species he later described. The letter also gives proof of JACK's botanical acumen. He could have known the genus *Boea* only from LAMARCK's account in the 'Encyclopédie méthodique' (which we know JACK had with him): few would have linked *Boea,* with short corolla tube, flat spreading lobes, yellow anthers at the mouth of the corolla and fruit with spirally twisted valves with a plant from Penang with trumpet-shaped flowers, included stamens and fruit with straight valves. There was no clear concept of a family Gesneriaceae at this time.

From Penang JACK accompanied RAFFLES, via Singapore, to Bencoolen in SW. Sumatra, this being where RAFFLES had his headquarters on the island. JACK's letters to WALLICH tell no more about plants related to Koom-Koom in this JACK's first stay in Bencoolen. Towards the end of 1819 RAFFLES and JACK returned to Calcutta and JACK took his collections and worked on them with WALLICH. On the way back to Bencoolen the ship put in to Tapanooly in NW. Sumatra. In a letter to WALLICH 'off Tapanooly', dated February 27 1820, JACK (BURKILL 1916) wrote *"What think you of a fourth species of Didymocarpus ...".* This is JACK's first use of the generic name *Didymocarpus* in his letters. He and WALLICH had evidently worked over JACK's collections and had decided that his plants from Penang belonged to the same genus as the Nepalese plants that WALLICH had by then named *Didmyocarpus*. When, later in 1820, JACK published the species from Penang and Tapanooly he noted below the generic description of *Didymocarpus "I am indebted for the above character of this hitherto unpublished genus to my esteemed friend Dr. Wallich, who has ascertained five species, natives of Nepaul; the four following have since been discovered in the Malay Islands".*

It is strange that JACK should refer to *Didymocarpus* as an unpublished genus. It is quite possible that even in February 1820, when RAFFLES and JACK left Calcutta to return to Bencoolen, news of the publication of HAMILTON's article in October 1819 had not yet reached Calcutta. However, it seems that WALLICH gave JACK no indication that publication was imminent, which suggests that he himself may not have anticipated that extracts of his letter to HAMILTON would be published. The description

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that WALLICH supplied to JACK was a revised one, taking into consideration JACK's Malayan species, particularly *Didymocarpus frutescens* Jack which had four fertile stamens. This mixture of diandrous and tetrandrous species in *Didymocarpus* was retained by R. BROWN, BENTHAM and DE CANDOLLE, in fact by all authors up to 1883 when C. B. CLARKE established the genus *Didissandra* for all the species with four stamens (for recent treatment of *Didissandra* see WEBER & BURTT 1998a).

In 1822 David DON published a short article, evidently as a result of the preparatory work for his 'Prodromus Florae Nepalensis', and established Didymocarpaceae ["Didymocarpeae"] as an independent family, adding to it two new genera, *Lysionotus* and *Trichosporum;* at the same time he mentioned in his introduction the genus *Chirita* Hamilt., giving enough description to validate the name. DON referred *Chirita* to Scrophulariaceae, but it belongs to Gesneriaceae and was, as will be mentioned later, at one time included in an overstretched concept of *Didymocarpus*.

The first species to be published under the generic name *Didymocarpus* were JACK's Malayan plants which appeared in 'Malayan Miscellanies' published from Bencoolen (JACK 1820). This paper also included species of *Cyrtandra* J. R. & G. Forster, a genus described from the south Pacific, but which has also proved to be prolific throughout Malesia. JACK recognized this genus as belonging to the same family as *Didymocarpus:* he probably knew little of Gesneriaceae, as at that time the name was applied only to tropical American plants, and he decided that these genera represented a new family. He took the name of this family (JACK 1823) from the oldest genus, *Cyrtandra*. DON and JACK were working at the same time, but were half the world apart.

DON's paper setting up Didymocarpaceae was read to the Wernerian Society in Edinburgh on 26 Jan. 1822 and was published in July 1822; JACK's paper was read at the Linnean Society of London on 7 May 1822, but not published till May 1823. It is clear, therefore, that DON's name Didymocarpaceae has priority over JACK's Cyrtandraceae, yet it was JACK's name that was adopted by those who kept the Old World plants distinct from the American Gesneriaceae – most notably by DE CANDOLLE (1845).

The first Nepalese species to be described and named in *Didymocarpus* were the seven published by D. DON (1825): all were based on WALLICH's material. DON used the family name Didymocarpaceae in this work and specifically rejected JACK's Cyrtandraceae on the grounds that *Cyrtandra* should be referred to Scrophulariaceae.

DON (1825) made no mention of *Henckelia* Spreng., it was at that time a monotypic genus from southern India. There is no indication that he

ever considered it in relation to his Nepalese plants. However, two years later SPRENGEL, in his revised edition of LINNÉ's 'Systema Vegetabilium' (SPRENGEL 1827), transferred all the species placed in *Didymocarpus* by JACK and by DON to *Henckelia*. Four years later WALLICH (1829) listed his Nepalese species under *Didymocarpus*, adding to them the one original species of *Henckelia, H. incana,* with the epithet changed to *rottlerianus,* only quoting, however, *Rottlera* Vahl, not *Henckelia*.

SPRENGEL (1827) had followed D. DON in referring *Chirita* to Scrophulariaceae; in fact he had reduced it to a synonym of *Bonnaya*. However, a few years later A. DIETRICH in the sixth edition of Species Plantarum (1831) placed the species of *Chirita* alongside those of *Didymocarpus* in *Henckelia*.

During the 1830's Robert BROWN devoted much attention to the family Gesneriaceae. He was under pressure to write the text to accompany the illustrations prepared for the account of Thomas HORSFIELD's Javanese plants (BENNETT & BROWN 1840); however his studies ranged much wider than these and included the question whether DON's Didymocarpaceae and JACK's Cyrtandraceae should be included in the neotropical Gesneriaceae. BROWN finally decided all these plants formed a single family, and his opinion has been upheld ever since. (The fact that the account in DE CANDOLLE's 'Prodromus' was published as late as 1845 under the name Cyrtandraceae was due to the fact that Gesneriaceae had already been published before BROWN's decision was known and the manuscript of Cyrtandraceae had been already prepared, for it was lent to MEISNER who published his own account in 1840. Publication in the 'Prodromus' was delayed by DE CANDOLLE's death in 1841.) BROWN's memoir (1839 and in BENNETT & BROWN 1840) also included a magisterial discourse on the structure of the stigma in *Chirita* in comparison with that of *Didymocarpus:* this was effective in keeping the two genera distinct until they were uncritically re-united by BAILLON (1888).

Robert BROWN added a new genus to the *Didymocarpus* complex. He called this *Loxocarpus,* apparently in reference to the oblique capsule, but he failed to describe its shape and seems to have regarded the long funicle of the erect seeds as the outstanding feature of the genus. He knew only one species, *L. incana* R. Br., in which the hump at the base of the fruit, which provides the necessary space for the elongated funicles, is well developed.

BENTHAM (1876) was the first to introduce a sectional classification into *Didymocarpus:* apart from sect. *Eudidymocarpus* (containing all the typical Sino-Himalayan species), he established sect. *Boeoides* for the rosulate tetrandrous Himalayan *D. lanuginosus* R. Br., sect. *Orthoboea* (incl. the genus *Henckelia*) for the species of S. India and Ceylon (nearly

all rosulate but diandrous), sect. *Heteroboea* for the then-known Malayan species (of which *D. crinitus* has since been taken as lectotype of the section), and he reduced R. BROWN's genus *Loxocarpus* to a section of *Didymocarpus,* remarking that sects. *Orthoboea* and *Loxocarpus* were more closely related to one another than either was to sect. *Eudidymocarpus*.

CLARKE (1883) transferred sect. *Boeoides* to his new tetrandrous genus *Didissandra,* and added five more sections to *Didymocarpus*. They were, with their present dispositions:

sect. *Monophylloides* – a synonym of *Chirita* sect. *Microchirita* (WOOD 1974).

sect. *Didymanthus* – retained as a section.

sect. *Kompsoboea* – the type is necessarily *D. kompsoboea* and this species is close to *D. crinitus:* the sectional name therefore becomes a synonym of sect. *Heteroboea*. Most of the other species included here belong elsewhere.

sect. *Paraboea* – raised to generic rank by RIDLEY (1905); subsequently retained and enlarged by BURTT (1984); now under revision by XU & BURTT (1991 and in prep.).

sect. *Hova* – raised to generic rank as *Hovanella* by WEBER & BURTT (1998b); the genus has only two species and is endemic to Madagascar.

After CLARKE's monograph there was a period that we now look back on as one of retrogression. BAILLON (1888) re-united *Didymocarpus* and *Chirita* under the illegitimate name *Rottlera* Vahl (*'Roettlera'*): he was followed in this course by K. FRITSCH in his influential treatment of the family for ENGLER & PRANTL, Die natürlichen Pflanzenfamilien (1893 - 94). A few botanists adopted this nomenclatural treatment, for example O. KUNTZE (1891), FRANCHET (1899). Others followed FRITSCH botanically but used the name *Didymocarpus* for the combined genus; amongst these were DIELS (1912), LINGELSHEIM & BORZA (1914), HANDEL-MAZZETTI (1936), CHUN (1946) and, finally, BACKER & BAKHUIZEN (1965).

This phase is now over: *Didymocarpus* and *Chirita* are now universally accepted as distinct genera. However, there remained a potential nomenclatural conflict over the generic name of *Didymocarpus*. This was avoided by its being listed as *nomen conservandum*. For a long time the corresponding *nomen rejiciendum* was given as *Rottlera* Vahl and it was not until the Botanical Congress at Montreal in 1959 that this illegitimate name was removed from the list and its legitimate replacement, *Henckelia* Spreng., was cited instead.

At first *nomina conservanda* were listed without any reference to the type species. These were proposed at the Amsterdam Congress in 1935 and appeared in the Stockholm Code published in 1952. The type species for *Didymocarpus* was then given as *D. aromaticus* Wall., and so it remained till the Montreal Code was published in 1961; there it appeared as *D. aromaticus* Wall. ex D. Don, Prodr. Fl. Nep. 123 (1825). This change was no doubt inserted merely as a correction, but in practice it amounted to a change of the type species. Robert BROWN had pointed out the confusion long before (BROWN 1839): the plant which D. DON had described as *D. aromaticus* was not the plant that WALLICH had intended by that name and illustrated under it in 1832. DON's publication had priority and therefore *D. aromaticus* must be retained for the plant he described, which was *D. subalternans* Wall. Because of this confusion HARA (1972) proposed that *Didymocarpus* should be typified by *D. primulifolius* D. Don, which is the plant WALLICH himself proposed to call *D. aromaticus*. This was accepted by the next Congress and the type therefore appeared as *D. primulifolius* D. Don in the Sydney Code (1983).

Meanwhile the most active person in this field after CLARKE's revision (1883) was H. N. RIDLEY, who was battling with the enormous influx of new species resulting from collections made in Malaya by himself and his colleagues and by collectors employed by Sir George KING, the Superintendent of RBG Calcutta. RIDLEY had already described a number of new species (RIDLEY 1893, 1896) when he published the first summary of Gesneriaceae of the Malay Peninsula (RIDLEY 1905), which showed that 37 out of 46 species placed in *Didymocarpus* had been described by himself. In this paper RIDLEY revived *Loxocarpus* as an independent genus and raised sect. *Paraboea* to generic rank. He also made additions to the sectional names in use in *Didymocarpus:* these were sect. *Elati,* sect. *Reptantes,* sect. *Salicini* (first published in RIDLEY 1896) and sect. *Acaules,* which has since been lectotypified by *D. lacunosus* Hook.f. (for reasons see BURTT 1954): this species has proved to be better placed in *Chirita* and the name therefore drops out of the *Didymocarpus* picture. RIDLEY's paper was re-issued (with minor changes, not affecting *Didymocarpus*) in 'Materials for a Flora of the Malayan Peninsula' (KING & GAMBLE 1909), and with updating formed the basis of the account in 'Flora of the Malay Peninsula' (RIDLEY 1923). In the 'Flora', sect. *Elati* was replaced by sect. *Eudidymocarpus,* but was revived later by WEBER & BURTT (1982) in a more restricted sense; *D. salicinus* was transferred to *Paraboea* (returned to *Didymocarpus* by BURTT 1971) and a new section, *Pectinati,* based on *D. pectinatus* was established. The sect. *Boeopsis* (lectotype *D. heterophyllus,* KIEW 1992) had been published previously (RIDLEY 1908), but too late for inclusion in the Materi-

als (KING & GAMBLE 1909); it included species from his previous sect. *Acaules* which was abandoned in the Flora. RIDLEY also proposed a new genus *Codonoboea* for three species that he had not previously been able to place to his satisfaction: *Didymocarpus lilacinus, D. ericiflorus* and *Paraboea leucocodon*. To bring three isolated species together into a new genus did not prove their affinity with one another. In his key to the genera RIDLEY differentiated the genus from *Paraboea* by its gibbous corolla with lobes very short and tooth-like. But the key separates *Didymocarpus* itself from the group including *Paraboea, Codonoboea* and *Loxocarpus* by attributing to it a trumpet-shaped corolla in comparison with a campanulate one: by following that lead most of the species in RIDLEY's *Didymocarpus* sect. *Boeopsis* would end up in *Paraboea* or *Codonoboea*. That *Codonoboea* was a thoroughly unsatisfactory genus was realized by KIEW (1990) who reduced the genus to a section of *Didymocarpus*. KIEW took *D. lilacinus* Ridl. as the type of her section *Codonoboea* and excluded from it *C. leucocodon,* which she transferred to *Didymocarpus* but left as a species of uncertain position within the genus. Unfortunately, *C. leucocodon* had been designated as lectotype of *Codonoboea* many years earlier in a Russian work by L. IVANINA (1967) and this choice must be maintained.

Over the past few years a full investigation of the limits of *Didymocarpus* and its allies has been undertaken, and the results are given in this journal (WEBER & BURTT 1998b). In brief, *Didymocarpus* is restricted to sect. *Didymocarpus,* sect. *Elati* and a few anomalous species. *Henckelia* is revived for the S. Indian species (*Didymocarpus* sect. *Orthoboea* Benth.) and is greatly expanded to include most species of 'Malesian *Didymocarpus*' and also the erstwhile genera *Loxocarpus, Codonoboea* and *Platyadenia*. The two species from Madagascar (*Didymocarpus* sect. *Hova* C. B. Clarke) are accommodated in a new genus, *Hovanella*.

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Address of the author:

B. L. BURTT

Royal Botanic Garden
Edinburgh EH3 5LR
Scotland, U.K.