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## William Roxburgh and the names of some Indian indigos

### Abstract

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In 1811, a paper by William Roxburgh was published in the Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. In it Roxburgh described four species used in dye manufacture in India and the surrounding region. This publication has been largely overlooked by plant taxonomists. Of the four names, one, *Nerium tinctorium*, had already been published. For the other three, *Asclepias tinctoria*, *A. tingens* and *Indigofera coerulea*, this represents the earliest place of valid publication. The application and typification of these names are reviewed. Some notes on other Roxburgh names appearing in the Transactions are included.

Additional key words: *Abelmoschus*, *Apocynaceae*, India, *Indigofera*, lectotypification, *Marsdenia*, *Wrightia*

### Introduction

William Roxburgh (1751–1815) is an important figure in the history of Indian botany. For some 20 years he was Superintendent of the East India Company's botanic garden in Calcutta. He documented the plant diversity of India and beyond, but the ultimate reason for doing so, at least as far as his employers were concerned, was to find useful and potentially valuable plants. Roxburgh's applied research was extensive and active (Robinson 2008). Much of it was reported by Roxburgh in papers and letters published in the Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. This material has largely been overlooked by plant taxonomists, though it was very much the focus of his obituary (Anonymous 1817).

In this paper, I review Roxburgh's output in the Transactions. Emphasis falls on one paper concerning various dye plants (Roxburgh 1811) that has particular significance in terms of botanical nomenclature.

### The indigo paper

This paper concerns four species of dye plant that Roxburgh had investigated. Descriptions of all four species are included. I will go through the four names in the order in which Roxburgh presented them and consider their application and typification.

#### *Nerium tinctorium*

Roxburgh provided a description of *Nerium tinctorium* and much information on its cultivation and processing. This, however, is not the earliest publication of the name. *Nerium tinctorium* actually appears to be the earliest published name for a Roxburgh plant taxon. From fairly early in his career in India, Roxburgh began writing descriptions of, and using a team of native artists to illustrate, the species that he encountered (Sealy 1956; Forman 1997). Copies of the descriptions and drawings were then sent to the Court of Directors of the East India Company in

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Fig. 1. Photograph of the lectotype of *Nerium tinctorum*, Roxburgh Icon No. 18 (K). – Reproduced with the kind permission of the Director and the Board of Trustees, Royal Botanic Gardens, Kew. – © Royal Botanic Gardens, Kew.



London. These drawings form the set of Roxburgh Icones now in the collection of the Royal Botanic Gardens, Kew, with a second set in Calcutta.

The first batch of such material came to the attention of Alexander Dalrymple, the Company's hydrographer, who included the account of *Nerium tinctorium*, and other material of Roxburgh's writings, in his compilation, the Oriental Repertory. In a letter to Sir Joseph Banks of 30 August 1791 (Chambers 2010), Roxburgh made it clear that this was not done with his prior approval: "Mr Dalrymple having taken from my collection & published one of the principal members thereof will no doubt render the rest less valuable, however I believe he did it from the best of motives." Roxburgh went on to publish the eponym *Dalrympelea* (*Staphyleaceae*), so he clearly forgave Dalrymple for publishing *N. tinctorium*.

The publication of *Nerium tinctorium* in the Oriental Repertory was largely forgotten until Mabberley (1977) reacquainted the botanical world with this work. Before then it was assumed that *N. tinctorium* was not validated until more than 40 years later in the posthumous publication of the complete (save cryptogams) Flora indica (Roxburgh 1832). Before that, Robert Brown (1810) had included *Wrightia tinctoria*, the accepted name for this plant, in his treatment of the *Asclepiadeae*. This appeared in a preprint version of a paper published in the Memoirs of the Wernerian Natural History Society the year before Roxburgh's paper on dye plants. Brown made no reference to *N. tinctorium*, but Mabberley (1977) argued that *W. tinctoria* R. Br. is based on *N. tinctorium* Roxb., as the Roxburgh specimen of this species that Brown saw in the Banksian Herbarium (now at BM) is annotated with the name *N. tinctorium*. Effectively, this argument invokes Art. 41.4 of the ICN (McNeill & al. 2012).

*Nerium tinctorium* seems not to have been typified before. There are Roxburgh specimens of this plant in various herbaria (BR, K-W, LINN, OXF; Forman 1997) and the drawing Roxburgh Icon No. 18. The published correspondence of Roxburgh to Sir Joseph Banks indicates a long series of dispatches of drawings and living plants and seeds to London but little mention of herbarium specimens. A letter dated 28 October 1797 (Chambers 2011) is the earliest to make specific mention of specimens. Apparently instigated by an agent of Aylmer Lambert visiting Calcutta with a request to make collections from the Calcutta Garden, Roxburgh sent a set of specimens with material for Sir Joseph Banks, as well as Lambert and Sir James Edward Smith (rather to Banks's annoyance). If little material was sent prior to 1797 and Roxburgh maintained a limited personal herbarium, the earliest of Roxburgh's published names, such as *N. tinctorium* or those appearing in the initial parts of the Plants of the Coast of Coromandel, cannot be assumed to have extant specimens as original material. Consideration of the drawings is therefore necessary. The plate that appeared in the Oriental Repertory, which has a publication date of 29 March 1791 printed on it, is clearly based on

Roxburgh Icon No. 18. The arrangement of the flowering shoot exactly matches the drawing, as do the other parts, though their layout differs. The Kew copy of the icon was received in London on 20 January 1791 (Sealy 1956), so it would have been available for Dalrymple to get copied. Given the relative rarity of the Oriental Repertory, particularly in botanical libraries, I feel it better to select the icon rather than the published plate as lectotype.

*Nerium tinctorium* Roxb. in Orient. Repert. 1: 40–41, t. 1. 1791 = *Wrightia tinctoria* (Roxb.) R. Br., *Asclepiadeae*: 63. 1810 [Mem. Wern. Nat. Hist. Soc. 1: 74. 1811]. – **Lectotype designated here:** Roxburgh Icon No. 18 (K!) [<http://apps.kew.org/floraindica/home.do>] – Fig. 1.

### *Asclepias tinctoria*

Roxburgh noted that this species was introduced to the Calcutta garden from Sumatra in the period when its founder, Robert Kyd, was still in charge. He also referred to William Marsden's description of taroom akkar (Malay name used by Marsden) in his History of Sumatra. Robert Brown (1810) also referred to Marsden's plant and a specimen in the herbarium of Sir Joseph Banks in describing *Marsdenia tinctoria*. Roxburgh made no reference to Brown in publishing *Asclepias tinctoria*, but it seems convenient to consider the reference to Marsden as an indirect citation of Brown's publication and therefore treat *A. tinctoria* as a new combination based on *M. tinctoria*.

Forster (1995) reported that there was no type material of *Marsdenia tinctoria* present in BM (which now includes the Banksian Herbarium). Whether the type specimen was temporarily mislaid or overlooked is not clear, but there is a specimen of Marsden's annotated by Brown in the herbarium that seems to be the sole element available on which to lectotypify *M. tinctoria*.

*Marsdenia tinctoria* R. Br., *Asclepiadeae*: 19. 1810 [Mem. Wern. Nat. Hist. Soc. 1: 30. 1811] = *Asclepias tinctoria* (R. Br.) Roxb. in Trans. Soc. London Encour. Arts 28: 301–303. 1811 = *Pergularia tinctoria* (R. Br.) Spreng., Syst. Veg. 1: 844. 1824. – **Lectotype designated here** (or possibly holotype): Indonesia, Sumatra, *W. Marsden s.n.* (BM barcode BM001014156!).

### *Asclepias tingens*

The publication of *Asclepias tingens* in the Transactions predates the generally cited 1815 publication of this name in the Plants of the coast of Coromandel (Roxburgh 1795–1820). Although Forster (1995), in proposing the new combination *Marsdenia tingens*, cited the basionym from the latter work, his name is still validly published (ICN Art. 41.8(a)) as there is no reference in the Plants of the coast of Coromandel to the earlier publication of *A. tingens*. Forster cited the type of *A. tingens* as follows:

“TYPE: Hort. Calc., H. B. [Buchanan] [undated] (holo: K–W [8190A] fiche at BRI)”. The material under this number is mounted on two sheets and actually consists of three gatherings as inferred from the attached tickets in the hand of Francis Buchanan-Hamilton. One is a specimen made in the Calcutta Botanic Garden in November 1814, and this is presumably the specimen cited as the holotype by Forster. It may have been from plants cultivated from the initial introduction, but the date of 1814 is too late for it to be original material for the name published in 1811. It is mounted with a specimen dated 28 June 1811 made in the Mungger Hills (Munger Hills, Bihar). On the second sheet is a specimen from Goyalpara (Goalpara, Assam) dated 3 September 1808. Roxburgh (1811) stated that he received material of this plant for cultivation in Calcutta from Buchanan-Hamilton brought by him from Pegu in Burma in 1795. Therefore the Munger and Goalpara specimens cannot be original material for *A. tingens* either. There is a specimen of *A. tingens* collected in Pegu from Buchanan-Hamilton’s herbarium now at BM, but there is no evidence that Roxburgh saw this. Because the specimen cited as “holotype” by Forster is not original material, it cannot be the type of the name; nor can it be “corrected” to a designation of neotype under ICN Art. 9.9 because other original material exists. There is a good specimen in the Smithian Herbarium (LINN) with the annotation “*A. tingens* R., Calcutta, Dr Roxburgh, 1809.” The plate (t. 239) published in the Plants of the coast of Coromandel was based on Roxburgh Icon No. 1226, but this is missing from the Kew collection of drawings (Sealy 1956). However, there is a copy among the set in the Calcutta herbarium (Sanjappa & al. 1994). This was the drawing that Nathaniel Wallich had copied in monochrome for Robert Wight to publish as his Icon 593 in *Icones plantarum Indiae orientalis* (Wight 1840–1853). Roxburgh (1811) indicated that a drawing accompanied his description published in the Transactions. This was not printed, but presumably it was another copy of Icon No. 1226. The Smith specimen is here designated as the lectotype of *A. tingens*.

*Asclepias tingens* Roxb. in Trans. Soc. London Encour. Arts 28: 304–306. 1811 [Pl. Coromandel 3(2): 34, t. 239. 1815] ≡ *Gymnema tingens* (Roxb.) Spreng., Syst. Veg. 1: 844. 1824 ≡ *Bidaria tingens* (Roxb.) Decne in Candolle, Prodr. 8: 623. 1844 ≡ *Marsdenia tingens* (Roxb.) P. I. Forster in Austral. Syst. Bot. 8: 692. 1995. – **Lectotype designated here:** “*Asclepias tingens* R.” [India], Calcutta, 1809, *W. Roxburgh s.n.*, LINN-HS 456.17 (LINN photo!).

### *Indigofera coerulea*

This name is generally cited as being published in the 1832 edition of *Flora indica*. The Transactions paper appeared some 20 years earlier. The name is generally accepted. The epithet appears as “*coerulea*” in the original

publication, not “*caerulea*”, which is often used, in error, when referring to this species. Ali (1958) proposed Roxburgh Icon No. 388 in the Kew collection as the lectotype of *Indigofera coerulea*. However, there are two drawings with this number at Kew (Sealy 1956; see also <http://apps.kew.org/floraindica/home.do>) and Ali did not indicate which of these was the lectotype. Therefore, this typification is considered ineffective. I designate here as lectotype a specimen in the Brussels herbarium that has a label with the species name written in Roxburgh’s hand.

*Indigofera coerulea* Roxb. in Trans. Soc. London Encour. Arts 28: 294–296. 1811 ≡ *Indigofera argentea* var. *coerulea* (Roxb.) Baker in Hooker, Fl. Brit. India 2: 99. 1876. – **Lectotype designated here:** “*Indigofera coerulea*”, *W. Roxburgh s.n.* (BR barcode BR0000005170104 photo!).

### Other names

The only Roxburgh names currently cited in IPNI (2013+) as being published in the Transactions are a genus and species of *Dipterocarpaceae*, “*Oleoxylin*” and “*Oleoxylin balsamifera*”, respectively. These appeared in a wide-ranging letter (Roxburgh 1805). The relevant text is brief: “A drying oil, or very thin balsam, extracted by incision from the trunk of a large tree which I have called *O. balsamifera*. It grows abundantly in Chittagong, and is chiefly used in painting.” This is clearly inadequate in terms of a description, so the names are not validly published (ICN Art. 38.3). The generic name was validated by Dupéron (1973) for an Oligocene fossil olive wood from southwestern France. Roxburgh’s “*O. balsamifera*” should probably be referred to *Dipterocarpus costatus* C. F. Gaertn.

The only other Roxburgh name appearing in the Transactions that might be considered validly published is *Hibiscus strictus*. This appeared in one of Roxburgh’s papers on vegetable fibres (Roxburgh 1806). Roxburgh wrote “an undescribed species from the Moluccas, which I now call *H[ibiscus] Strictus*, on account of the remarkable straightness of the stem and branches.” The name is generally considered to date from *Flora indica* of 1832. It is a synonym of *Abelmoschus ficulneus* (L.) Wight & Arn. It seems unlikely that this extremely brief descriptive statement is adequate to validate the name, but as there seems to be no nomenclatural repercussion of note from moving back the date of publication, I do not intend to seek a binding decision on this (ICN Art. 38.4).

*Hibiscus ficulneus* L., Sp. Pl. 2: 695. 1753 ≡ *Abelmoschus ficulneus* (L.) Wight & Arn., Wight’s Cat. Pt. 1: 14: 1833. – Lectotype (designated by Borssum Waalkes 1966: 102): Dillenius, Hort. Eltham. 1: t. 157, f. 190. 1732. = *Hibiscus strictus* Roxb., Fl. Ind., ed. 1832, 3: 206. 1832. – **Lectotype designated here:** *W. Roxburgh s.n.* (BR barcode BR0000005180349 photo!).

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