A Clarification of B. C. Seeman's Malagasy Species of Colea Meisn. (Bignoniaceae)

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29. PHILLIPSON, Peter B. & Martin W. CALLMANDER: A clarification of B. C. Seeman's Malagasy species of Colea Meisn. (Bignoniaceae)

Introduction

In the course of reviewing the *Bignoniaceae* for the Catalogue of the Vascular Plants of Madagascar (MADAGASCAR CATALOGUE, 2013), we were confronted by the confusion that surrounds the names *Colea hispidissima* Seem. and *Colea purpurescens* Seem. Both of the species were described by Berthold Carl Seeman and are based on collections made by Louis-Hyacinthe Boivin in Madagascar. The typification and correct application of these names, and the identity of the corresponding type material have never been adequately resolved.

Seeman (1825-1871), a widely-travelled German-born botanist who trained at the Royal Botanic Gardens Kew, is best known for his world circumnavigation from 1847 to 1851 as botanist onboard the *HMS Herald*, and also for his botanical catalogue of the flora of the Fijian islands (SEEMAN, 1852-1857). Seeman also worked on the *Bignoniaceae*, and published *Synopsis Crescentiacearum: an enumeration of all the Crescentiaceous plants at present known* (SEEMAN, 1860). The two Malagasy species of *Colea* Meisn. mentioned above are among the various *Bignoniaceae* newly described in this work, although Seeman himself did not visit Madagascar. Included in his concept of *Colea* Meisn. were eleven species: the two mentioned above, six others from Madagascar, *C. tripinnata* Lour. from Asia (now *Vitex tripinnata* (Lour.) Merr.), *Colea mauritiana* DC. from Mauritius and the newly described *C. seychellarum* Seem. from the Seychelles. Five of the Malagasy species accepted by Seeman in *Colea* have subsequently been transferred to either *Ophiocolea* H. Perrier or *Rhodocolea* Baill.

Boivin (1808-1852) was a French botanist and explorer. He was commissioned by the Muséum national d'Histoire naturelle (MNHN) in Paris to serve as botanist on the Oise Expedition (1846-1852) (DORR, 1997). During this expedition, he collected plants on the East Coast of Africa, in the Comoros and Mascarenes, and in Madagascar. Boivin probably collected around 1000 numbers in Madagascar, fewer than the 5000 suggested by GROUZIS & al. (2010), the latter number would be a good estimate for his entire collection from the Oise Expedition (incl. Africa and other Indian Ocean Islands). Boivin first visited Madagascar in 1846, in the company of Alphonse Charles Joseph Bernier, starting on the island of Nosy-Be. They then visited the northeastern coastal region (Baie d'Antsiranana, Baie de Rigny, Port Lewen and Vohémar) and later headed south to Île Sainte-Marie. Boivin then revisited all of these localities alone on several occasions between 1847 and 1852, spending lengthy periods at Sainte-Marie and Nosy-Be. Many of Boivin's collections lack collection numbers and many lack any locality information. In P they often just bear standard labels printed: "*Madagascar. Voyage de M. Boivin. 1847-1852"*. In some cases a particular number was used for collections made on different dates and from different localities.

Seeman's *Colea hispidissima* is based on *Boivin 1820*, a collection from Sainte-Marie comprising vegetative parts with pinnate leaves, and detached, small, dense, evidently cauliflorous, inflorescences. BAILLON (1887) recognized that the flowers of Seeman's *C. hispidissima* could not belong to a *Bignoniaceae,* and in his *Histoire des Plantes* (BAILLON, 1892) he transferred it to a new genus - *Varengevillea* Baill. He placed this genus in the family *Verbenaceae* tribe *Viticeae* Schauer adjacent to the genus *Peronema* Jack - a south-east Asian genus also comprising a single species which also has pinnate leaves, but with an open terminal inflorescence of much smaller flowers.

PERRIER DE LA BÂTHIE (1938a, 1938b) was the first to realize the type of *Colea hispidissima* to be a mixed gathering comprising leaves of a *Bignoniaceae* and flowers of a species of *Vitex* L. *(Verbenaceae*, tribe *Viticeae)*, and in his revision of the Malagasy *Bignoniaceae* he treated the species as "*species*

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non statis nota". MOLDENKE (1956: 131-132), revising the *Verbenaceae* for the *Flore de Madagascar et des Comores*, examined the flowers of the type of *Colea hispidissima* and considered them to be the same as those of *Vitex congesta* Oliv. He wrote: *"L'épithète spécifique* hispidissima *bien qu'ayant la priorité, n'est pas valable parce qu'il* [sic] *est basé sur un mélange de fleurs de cette espèce* [i.e. *Vitex congesta*] *et de feuilles de* Rhodocolea racemosa (Lam.) H. Perrier *var.* humblotiana *(Baill.) H. Perrier (Bignoniaceae)"* = "The specific epithet *hispidissima* is not valid even though it has priority, because it is based on a mixture of flowers of this species [i.e. *Vitex congesta*] and leaves of *Rhodocolea racemosa* var. *humblotiana* (Bignoniaceae)". Moldenke's assertion is incorrect - a name is not invalidated by being based a mixed gathering. In such cases, the application of the name is determined through lectotypification. The genus *Vitex* and its relatives are now placed in the Lamiaceae (APG III, 2009).

Colea purpurescens is based on three collections: one from Nosy-Be (fertile), and the other two from different localities on Sainte-Marie (both sterile). PERRIER DE LA BÂTHIE (1938a) already implicitly designated the fertile collection, *Boivin 2105/2*, as the lectotype by excluding the other specimens from his concept of *C. purpurascens*. Curiously, one of the excluded sterile specimens from Sainte Marie appears to be part of the same gathering as the type material of *C. hispidissima* creating further confusion and uncertainty around the identity of Seeman's two *Colea* species.

We have examined the type material on which Seeman's two *Colea* names are based, and have determined the identity of each element. In this article we discuss this material and formally designate a lectotype for *C. hispidissima*. We also establish the necessary new combination *Vitex hispidissima* (Seem.) Callm. & Phillipson and designate an epitype for this species. We also provide general observations on the two species and IUCN risk of extinction assessments, based on a review of all available herbarium material. A complete list of specimens for each of the two species can be found in the MADAGASCAR CATALOGUE (2013) together with distribution maps, scans of the specimens discussed are available through the database of the Paris herbarium (SONNERAT, 2013).

Systematics

Lamiaceae

Vitex hispidissima (Seem.) Callm. & Phillipson, **comb. nova.**

≡ *Colea hispidissima* Seem. in Trans. Linn. Soc. London 23: 9. 1860.

≡ *Varengevillea hispidissima* (Seem.) Baill. in Hist. Pl. 11: 116. 1892.

Lectotypus (designated here): **MADAGASCAR. Prov. Toamasina:** Sainte-Marie, Forêt de Tafondrou [Tafondro], XII.1849, *Boivin 1820a* (P [P04353039 in part: flowers]!; isolecto-: [P04353040]!). **Epitypus** (designated here): **MADAGASCAR. Prov. Toamasina:** Ambanizana, on the Masoala Peninsula, ca. 30 km SE of Maroantsetra, 15°38'S 49°58'E, 130-300 m, 12.V.1988, fl. & fr., *Lowry & al. 4475* (MO-3662349; isoepi-: K [K000479825]!, P [P04397908]!, TAN).

= *Vitex congesta* Oliv. in Hooker's Icon. Pl. 23: tab. 2240. 1892. **Typus: MADAGASCAR:** Northern, s.d., fl., *Baron 6676* (holo-: K [K000192803]!; iso-: P [P00440364]!).

Observations. – *Colea hispidissima* Seem. is based on a mixed collection comprising flowers of a plant hitherto known as *Vitex congesta*, and leaves of *Rhodocolea racemosa* var. *humblotiana*. We have located four sheets pertaining to this gathering at P. Two of the sheets bear an annotation written on the printed *"Madagascar. Voyage de M. Boivin. 1847-1852"* labels in Seeman's hand: *"Colea hispidissima. Seeman"*, and both also bear annotations by Perrier de la Bâthie. One of these sheets [P00647429], bears an original label in Boivin's hand with the information: *"Bignoniaceae. Forêt de Lafondrou. X^{bre} 1849. 1820. Ste Marie de Madagascar"*, the notation *"X^{bre}"* is shorthand for *"décembre"*, and *"1820"* is taken to be Boivin's collection number. This sheet carries a single sterile vegetative portion of stem bearing two leaves. The second sheet annotated by Seeman [P04353039] lacks a hand-written Boivin label bearing the date, collection number and locality information, but carries both a sterile vegetative portion which is very similar to that of the first sheet, and three detached inflorescences. In addition this sheet bears a capsule containing a few fragments of dissected flowers and written on it is Baillon's hand-written description of the flowers and a separate label bearing Baillon's annotation *"Varengevillea hispidissima H. Bn."*. These two sheets unquestionably represent type material on which Seeman based his description of the leaves and flowers of *Colea hispidissima*.

A third sheet of this collection [P04353040] bears no original Boivin hand-written label, and just two capsules containing floral fragments, each with annotations by Baillon, as follows: *"Nerseemania Colea hispidissima Seem! Madag."* on one, and *"Varengevillea hispidissima H. Bn Madag!"* on the other. The sheet bears no annotation by either Seeman or Perrier de la Bâthie. This, and the second sheet mentioned above also bear printed labels from Moldenke indicating them to be part of the type collection. At what time the material on the third sheet become separated from the other sheets and therefore whether or not it was actually seen by Seeman is not clear, but we agree with Moldenke's conclusion that it represent part of the type, and conclude that the material is all part of Boivin's collection from Tafondro numbered *Boivin 1820* made in October 1849. The name *"Nerseemania"* written on one of the specimen capsules by Baillon does not seem to have

been published, but we assume that was the name Baillon originally intended to give to his new genus. We do not know why Baillon decided to create the name *Varengevillea* for the genus, which we suppose commemorates the small coastal village of Varengeville-sur-Mer near Dieppe in Normandy, France since we have not found any other source for the name.

A fourth sheet [P00647448] is one of the sterile syntypes of *C. purpurescens* with this name written in Seeman's hand on a printed Boivin label. It also bears a hand-written Boivin label numbered *Boivin 1821/3*, and the locality: *"Forêt de Lafondrou»*, the date: *"X^bre 1849"*, and also the information: *"Les f(eui)lles appartiennent peut-être au no._____ et réciproquement"* = "The leaves possible belong to no._____ and *vice versa"*. Clearly Boivin had the intention to add the relevant number in the blank space, but he omitted to do this. Evidently the confusion with collection numbering and the mixing of flowers of a *Vitex* and the leaves of a *Bignoniaceae* started at the time of collection or soon thereafter. One might suppose that Boivin did actually collect the flowers of the *Bignoniaceae* and leaves of the *Vitex*, but that these have been lost or mislaid since the very beginning. Seeman added to the confusion by including this specimen in *C. purpurescens* rather than in *C. hispidissima* which would have seemed more reasonable. Perhaps this was simply an error with his annotation of the specimens.

Moldenke (1956: 132) already mentioned that the epithet *hispidissima* has nomenclatural priority over *Vitex congesta*, but failed to adopt the epithet for this species, wrongly stating it to be invalid. We designate as the lectotype of *Colea hispidissima* the sheet bearing flowering material of Boivin's collection that was annotated by Seeman, and we make the necessary new combination in the genus *Vitex*. To avoid further confusion we have annotated the flowering material in the herbarium as *Boivin 1820a* and the vegetative material as *Boivin 1820b*. We regard *V. congesta* to be a synonym of *V. hispidissima*. The species is very distinctive with the lobes of the calyx covered by an unmistakable purple indument and with its flowers born on dense sessile cauliflorous inflorescences (Fig. 1). Although not present on the type material, its large glabrous palmate leaves are also distinct. Given the fragmentary nature of the original *Boivin* material we choose the specimen *Lowry & al. 4475* to serve as an epitype. It is well-representative of the species, with duplicates present in numerous herbaria, and it is the subject of an excellent photograph (Fig. 1). This species occurs on the Masoala Peninsula and on the hills to the west of the Baie d'Antongil, and on Île Sainte-Marie.

A further minor confusion exists due to *Boivin's* numbering, since another *Boivin 1820* specimen exists at P bearing an original hand-written label with the number clearly marked. The specimen [P00425804] is from a different locality on Ile Sainte Marie of *Sesamum indicum* L. *(Pedaliaceae)* collected in March 1847.

Conservation status. – With an EOO of 10,858 km^2, an AOO of 126 km^2 and 9 subpopulations, one encompassed in a protected area (Masoala), *Vitex hispidissima* is assigned a preliminary status of Least Concern (LC) following the IUCN Red List Categories and Criteria (IUCN, 2012) (calculation following Callmander & al., 2007).

Bignoniaceae

Colea purpurescens Seem. in Trans. Linn. Soc. London 23: 9. 1860.

Typus: Madagascar. Prov. Antsiranana: Forêt de Loucoubé [Lokobe], Nossi-bé, 1847-1852, fl., *Boivin 2105/2* (lecto-: P [P00647449, P00647450]!) (lectotypified by Perrier de la Bâthie, 1938a: 46).

Observations. – Seeman (1860) based *C. purpurescens* on a specimen at P of *Boivin 2105/2* from Nosy-Be (2 sheets, one with a portion of stem, with an attached entire leaf and a separate detached leaf and the other with a detached leaf and three detached cauliflorous inflorescences) and two sterile specimens from Sainte-Marie on the east coast: *Boivin s.n* (2 sheets) and *Boivin 1821/3*. All three collections are all somewhat similar vegetatively. These specimens all bear annotations of the species name in Seeman's hand, although the species protologue is not explicit about the specimens included - he wrote: "Colea purpurascens *Seem. MSS. in Herb. Paris. Geogr. Distr. Ste. Marie de Madagascar (Boivin!); Nossi-be (Boivin!)*". Perrier de la Bâthie (1938) chose the collection from Nosy-Be as the lectotype. We consider the two sheets to be complementary, and therefore they should be regarded together as a two-sheet lectotype, annotated accordingly as "Lectotype 1/2" and "Lectotype 2/2". The excluded sterile syntype material from Sainte Marie pertains in part to *Ophiocolea floribunda* (Lindl.) H. Perrier (*Boivin s.n.* [P00834901, P00834902]) and in part to *Rhodocolea racemosa* var. *humblotiana* (*Boivin 1821/3* [P00647448]). The latter specimen probably being a part of the same gathering as the type material of *Colea hispidissima* as discussed above.

Colea purpurascens is very distinctive species endemic to the Sambirano Domain (*sensu* Humbert, 1951, 1955), where it is known only from Nosy Be and the Kalabenono massif, north of Ambanja. It can be easily recognized by its large leaves, often longer than 50 cm, with a purple rachis and long petiolules (ca. 1-1.5 cm).

Conservation status. – With an EOO of 57 km^2, an AOO of 27 km^2 and 2 subpopulations, one encompassed in the protected area network (Lokobe), *C. purpurascens* is assigned a preliminary status of Endangered (EN B1ab[ii, iii]+2ab[ii, iii]) following the IUCN Red List Categories and Criteria (IUCN, 2012) (calculation following Callmander & al., 2007).

Fig. 1. – Inflorescence of a living plant of *Vitex hispidissma* (Seem.) Callm. & Phillipson.
[Photo: P. P. Lowry II, from *Lowry & al. 4340*, MO]

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