WEBBIA Journal of Plant Taxonomy and Geography

Firenze University Press
www.fupress.com/webbia

Citation: Friis, I. & Weber, O. (2024). Xylopia nilotica (Annonaceae) in Ethiopia, Sudan, South Sudan, and Uganda, with a review of the genus in North Eastern Tropical Africa. *Webbia. Journal of Plant Taxonomy and Geography* 79(2): 239-254. doi: 10.36253/jopt-16134

Received: May 10, 2024

Accepted: June 8, 2024

Published: September 3, 2024

Data Availability Statement: All relevant data are within the paper.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Editor: Riccardo M. Baldini

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Xylopia nilotica (Annonaceae) in Ethiopia, Sudan, South Sudan, and Uganda, with a review of the genus in North Eastern Tropical Africa

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Abstract. Based on written records and specimens of the new species, *Xylopia nilotica* D. M. Johnson & N. A. Murray (2018), described from Uganda and west of the Nile in Sudan and South Sudan, we have mapped the species. We find that it also occurs east of the Nile in South Sudan and in western Ethiopia. Its habitats range from open rain forest to open woodland. Modelling the potential distribution of *X. nilotica* suggests that it occurs in the periphery of the upper Nile basin, but it is probably undercollected. The potential distributions of *X. longipetala* (a Guineo-Congolian species) and *X. holtzii* Engl. (an East African coastal species), distinct but previously considered conspecific with *X. nilotica*, only marginally overlap with that of *X. nilotica*, which is endemic to the countries Uganda, South Sudan, Sudan, and Ethiopia, apparently a unique pattern of endemism. The new information does not change the assessment of *X. nilotica* as Vulnerable (VU). Other species of *Xylopia* in North Eastern Tropical Africa are *X. rubescens* Oliver and *X. thomsonii* Oliver in the Equatoria region of South Sudan, and *X. rubescens*, *X. staudtii* Engl. & Diels, and *X. aethiopica* (Dunal) A. Rich. in Uganda. A record of *X. aethiopica* in Ethiopia is based on false label information on the only known specimen.

Keywords: Annonaceae, conservation, modelled distribution, Nile Basin, North Eastern Tropical Africa, *Xylopia*.

INTRODUCTION

Updating the Flora of Ethiopia and Eritrea

The only species of *Xylopia* documented in the *Flora of Ethiopia and Eritrea* was *X. parviflora* (A.Rich.) Benth. from the western lowlands of Ethiopia. The present work updates the nomenclature and records of *Xylopia* (Annonaceae) in North Eastern Tropical Africa, which here includes Ethiopia, Sudan, South Sudan, and Uganda. These countries include the north-easternmost areas of Africa where the genus *Xylopia* occurs. Our work provides habitat notes on *X. nilotica*, the only species of *Xylopia* endemic to the region, supported by field experience of the plants and their habitats. The paper also provides a model of potential distribution of two species previously considered conspecific with *X. nilotica*. The account follows other papers presenting specific improved information that has become available after the *Flora of Ethiopia and Eritrea* was completed in 2009 (Friis et al. 2024). First, Friis et al. (2011) published a list of newly discovered species, later, articles on the genus *Plumbago* (Plumbaginaceae in Friis et al. 2013), and on *Euphorbia venefica* (Weber et al. 2020).

Verdcourt (2000: 7), in *Flora of Ethiopia and Eritrea*, recognized only one species of *Xylopia* from Ethiopia, *X. parviflora*, but this Ethiopian plant is *X. nilotica* D.M. Johnson & N.A.Murray (2018: 126), which is not closely related to *X. parviflora*, the name of which has also been changed to *X. longipetala* De Wild. & T.Durand. The drawings of twigs, leaves and flowers of what is called *X. parviflora* in *Flora of Ethiopia and Eritrea* (Fig. 1.3.6–8) were made from material from the Kenya coast (*Gillett & Kibuwa* 19846), now identified by Johnson and Murray (2018: 121) as *X. holtzii*. The drawings of fruits and seeds (Fig. 1.3.9–10) were made from material from Liberia (*Baldwin* 6970), which Johnson and Murray (2018: 151) identify as *X. acutiflora*.

Patterns of collecting activity in North Eastern Tropical Africa, and records of Xylopia *in the floristic and ecological literature*

Data documenting the distribution and ecology of *Xylopia* in previous literature on North Eastern Tropical Africa is scattered. Although both Uganda, the former Sudan (including the present South Sudan), and Ethiopia have a long history botanical collecting beginning before 1850, the number of herbarium specimens of vascular plants from western Ethiopia, Sudan and South Sudan is low and the collected areas limited (Beentje and Smith 2001; Friis 2009a: 5–25, 2009b: 97–123; Darbyshire et al. 2015: 11).

According to the above sources, botanical collecting in Ethiopia was centred on the highlands until ca. 1950. In the former Sudan most collecting went on along the Red Sea coast, in the area around Khartoum, along the Blue Nile, around Jebel Marra and in a narrow zone along the White Nile. A map based on the RAINBIO mega-database (Sosef et al. 2017: Fig. 5) confirms that collecting activity in Sudan by botanists other than 19th century explorers like Georg Schweinfurth began in the 1920s and 1930s, mainly in a belt across the country at the level with Khartoum and southwards towards the present border with South Sudan. After Sudanese independence, collecting activity in the country has been low due to long periods of civil unrest and war. A similar situation existed in South Sudan: after protracted fighting against the Sudanese government, South Sudan became independent in 2005, but the fight for autonomy was followed by internal unrest, and the only reasonably well collected area is the extreme south along the White Nile (south of Bor and Juba), a narrow zone to the west of the Nile along the border with Uganda and the Democratic Republic of the Congo, and the Imatong, Dongotona and Didinga Mountains to the east of the Nile.

With a grid of one degree cells, Küper et al. (2006: Fig. 2) estimated the deficiency of data documenting plant distributions in Africa south of the Sahara, analysing the differences between observed and modelled number of species per cell. The study showed a high degree of data deficiency in the southern part of Sudan, in the central part of South Sudan, and in northern and central Uganda. A similar pattern was shown for Uganda by Beentje and Smith (2001: Fig. 1–2), based on an estimated degree of floristic exploration; only a zone along the shores of Lake Victoria and one in Western Uganda along the lakes in in Albertine Rift were indicated as well-collected. Using a grid of half-degree cells, Sosef et al. (2017: Fig. 1) showed a pattern similar to that of Küper et al. All studies therefore show deficient data for Sudan and South Sudan, more representative data from Ethiopia (even in the western lowlands) and from Uganda, particularly near Lake Victoria and in Western Uganda.

Due to the scarce herbarium material and the limitation of other information, we have here cited and evaluated ecological information from floristic and ecological literature. Some ethnobotanical observations of importance for conservation are also cited. The nomenclature of the original publications in relation to the synonymy of by Johnson and Murray (2018) is incorporated in the section *Species*. Brief references to the recent names are also made here in sharp brackets.

Jackson (1956: 356) observed on a habitat in which *Xylopia vallotii* [*X. nilotica*] occurred: “Near the Imatong [Mountains], gallery forest may be regarded as a reduced type of rain forest confined to the vicinity of stream beds [Note by Friis and Weber: In the classification of White (1983: 79), Jackson’s Sudanian “rain forest” would not be considered a typical rain forest, but rather “Drier peripheral semi-evergreen Guineo-Congolian rain forest …”]. As a riverine habitat, it is generally found in deep U-shaped valleys and in addition to the extra supplies of ground water produced by the streams, the protection from fire afforded by the steep slopes of the valleys is an important factor in preserving the forest. The characteristic dominants are *Khaya grandifoliola*, *Cola cordifolia*, *Syzygium guineense* and *Erythrophleum guineense*, while other species occurring include *Chlorophora excelsa*, *Aphania senegalensis*, *Xylopia vallotii*, *Trichilia prieureana*, *Rauvolfia oxyphylla*, *Erythrina excelsa* and *Cassia petersiana*." Jackson did not cite specimens but we have traced *Jackson* 763 (FHO, KHF) from Imelia forest in the Kinyeti Valley near the Imatong Mountains.

Harrison and Jackson (1958) did not mention *Xylopia* in their description of the vegetation of Sudan. Specimens from hills around the Nuba Mountains in Kordofan were mentioned in floras as *X. vallotii* [*X. nilotica*] and *X. parviflora* [*X. nilotica*]. These specimens were collected in vegetation which Harrison and Jackson classify as "Hill Catena", a complex vegetation on mountain slopes with various types of forest and woodlands and with its main extension on the western slope of the Ethiopian Highlands.

El Amin (1990: 13–14) cited four species of *Xylopia* from Sudan with indication of their ecology: (1) *X. acutiflora* [*X. thomsonii*] in high rainfall savannah and gallery forests in Southern Bahr El Ghazal, South Western Equatoria and Southern Kordofan; (2) *X. aethiopica* [see below] in high rainfall savannah and swampy forest; (3) *X. parviflora* [*X. nilotica*] in riverine and swamp forest in the tall grass savannah in Nuba Mountains (Jebel Eliri) and in the Equatoria region; and (4) *X. rubescens* Oliv. in riverine forests in high rainfall savannah in the Equatoria region. Because El Amin did not cite voucher specimens, it is not possible to relate these four names directly to those of Johnson and Murray (2018) but based on geography, ecology and the morphological descriptions in his work, the taxonomic position of El Amin's species has been suggested here in the section *Species*. The identity of El Amin's *X. aethiopica* is not clear, Darbyshire et al. (2015: 72) state that "It [*X. aethiopica*] is likely to occur in Equatoria, but this needs confirmation."

Verdcourt (1971: 79), Friis (1992: 94), and Verdcourt (2000: 7) indicated that the distribution of the only Ethiopian species, called *X. parviflora* [*X. nilotica*], extended in lowland forest vegetation across Africa from the Atlantic to the Indian Ocean and included *X. holtzii* Engl. on the east coast of Africa. Friis (1992) mentioned from own observations in the western Ethiopian lowlands that *X. parviflora* could be a tree up to c. 10 m high, occurring in woodland with *Acacia sieberiana*, *Annona senegalensis*, *Lannea barteri*, *Ficus dicranostylis*, *Bridelia scleroneura*, and *Grewia mollis*. These associated species are typical of the western woodlands of the Gambela Region (Friis et al. 2022: 201), rather than of the Transitional rainforest of Friis et al. (2010: 106–113), from where the species of *Xylopia* was also recorded. This is the same vegetation in Ethiopia as the type referred to in Friis (1992: 28) with White's name "Dry peripheral semi-deciduous Guineo-Congolian rain forest."

Woube (1995: 73, 76) recorded the Anuak name *Orway* for trees he named *X. parviflora* [*X. nilotica*] and stated that it occurred "along waterways in the study region", which must mean in riverine forest. The wood was useful for dug-out canoes, mortars, pestles and tool-handles and was much in demand, for which reason the tree was rare and often utilised when only 10–15 years old. On a specimen (cited below), Woube recorded a DBH of ca. 50 cm.

Senbeta et al. (2007: 34) recorded *X. parviflora* [*X. nilotica*] in their analysis of the Sheko forest in SW Ethiopia. This forest is located near Mezan Teferi and Tepi at 7° 00'–10' N, 35° 20'–40' E, with altitudes ranging from 900 to 1810 m. *Xylopia* did not appear in the phytosociological statistics of the paper, only recorded from Sheko without further information in a in a general species list from the forests in "Appendix 1". The Sheko Forest is partly a lowland forest and partly an Afromontane forest; the lowland forest occurs in the valleys to the west of the road between Mezan Teferi and Tepi, at altitudes below 1250 m. No specimen at ETH documents the identification by Senbeta et al.

Darbyshire et al. (2015: 72–73) listed information about these species of *Xylopia* in Sudan and South Sudan: (1) *X. acutiflora* [*X. thomsonii*] was indicated as a shrub or small tree is forests; (2) *X. aethiopica* was only cited with a reference to El Amin (1990: 13) and indicated as a shrub or tree in swamp forest or moist woodland, but according to Johnson and Murray (2018: 76), a plant called shrub at the stage of flowering is almost certainly not *X. aethiopica*; (3) *X. longipetala* [synonym *X. parviflora*; *X. nilotica*] was indicated as a tree in forest and dense woodland; and (4) *X. rubescens* was indicated as a tall tree in riverine and swamp forest.

Johnson et al. (2017: 8) described new species of *Xylopia* from Eastern Africa, and analysed *X. parviflora* sensu Verdcourt (1971). The name *X. parviflora* was rejected as illegitimate (Maas et al. 1986: 277) after Verdcourt's 1971-account, and replaced with *X. longipetala* De Wild. & T. Durand. Johnson et al. pointed out that material identified as this taxon from western and central Africa, including the type of *X. longipetala*, differed in many vegetative, floral and fruiting characters from East African material. The East African material shared more similarities with *X. odoratissima* Welw. ex Oliv. than with *X. longipetala*.

Johnson and Murray (2018), in their monograph of the African species of *Xylopia*, recorded the species from North Eastern Tropical Africa that are listed here in the part called *Species*. In their work from 2018, Johnson and Murray analysed further the "East African material" from their 2017-work. They described and named a new species, *X. nilotica,* restricted to the Nile Basin and distinguished from the East African coastal species, *X. holtzii*, by mainly vegetative characters, as well as by fruiting characters. This pair of species was morphologically nearest to, but distrinct from *X. odoratissima*, which is distributed in southern Africa from Angola to Zambia, Zimbabwe, Namibia and Botswana.

Masresha et al. (2024), in an analysis of forests in the western lowlands of Ethiopia, observed *X. parviflora* [*X. nilotica*] with a density of 93.4 (trees per ha), a DBH (in m) of 5.6, and a basal area of 0.08 (indicated as in m^2/ha – this indication must be an error by Masresha et al.). The density listed is one of the two highest for trees in their study area; the common lowland tree *Celtis zenkeri* had a density of 90.3 trees per ha. According to the field observations of the present first author, this is a highly unusual density of *Xylopia* in the western Ethiopian lowlands. It may be due to a misidentification during recording in the field, and it would only be possible in stands of many young trees. However, the latter assumption does not agree with Masresha et al.'s indication of an exceptionally high average DBH of 5.6 m. Although no specimen at ETH documents the identification, there is no reason to doubt that the species does occur in the Gambela forests.

Xylopia aethiopica *and other species in "the Ethiopian collections of Dr. Rousseau"*

The record of *Xylopia aethiopica* from Ethiopia cited by Johnson and Murray (2018: 82), "ETHIOPIA. Rég. de Bonga, Jul 1909 (yg fr), *Rousseau* s. n. (L)" is almost certainly wrong, because – most likely – it is based on faulty label information on the specimen, which is registered in the Naturalis database (https://bioportal.naturalis.nl/en/specimen/L.4370474, accessed April 2024) and is correctly identified as *X. aethiopica*. The text on the label is: "HERBIER de Ch. D'Alleizette / Plantes provenant d'échanges. / Xylopia aethiopica L. / Abyssinie: Rég. de Bonga, partes boisées / Juillet 1909 / Dr. Rousseau". In the Naturalis database the specimen is annotated: "Actual locality unknown, material stolen in P herbarium." Dr. J. Wieringa at Naturalis (pers. com.) has concluded that Charles d'Alleizette, after having sold duplicates of his own collections from Madagascar to Leiden, apparently started taking duplicates from the collections of others in the Paris herbarium, making up new labels and selling the specimens to the Leiden Herbarium as if they were obtained by exchange. In Naturalis, there are more than 360 specimens labelled "Herb. Ch. D'Alleizette", said to have been collected by "Dr. Rousseau" from localities all over Ethiopia and dated "Julliet 1909", "Aout 1909" and "Julliet 1910", mostly from well-known collecting sites, for example from G.W. Schimper's localities in Tigray and Gondar. In the *Index Herbariorum - Collectors* (Vegter 1983: 791) there is no collector named "Rousseau" having collected in Ethiopia in 1909–1910. In *Encyclopaedia Aethiopica*, a critical and scholarly work with more than 6000 pages (Uhlig et al. 2003–2014), there are detailed accounts of travels by European scholars in Ethiopia up to mid-1900, but no record of a "Dr. Rousseau". It is unlikely that it was possible with the transportation facilities in 1909-1910 to travel so widely in Ethiopia in one or two months. Moreover, specimens labelled "HERBIER de Ch. D'Alleizette / Plantes provenant d'échanges" and said to have been collected by "Dr. Rousseau" are only known from L.

Xylopia aethiopica seems to be the only species among the "Ethiopian collections of Dr. Rousseau" that is not known from other Ethiopian material. We have found no other case in the Naturalis Database, but similar cases where not only the collector, but also the country of origin, locality and date were fabrications are known from other African "d'Alleizette collections" (several cases according to Wieringa pers. com.), as well as a single record of *X. aethiopica* from Chad, cited by Johnson and Murray (2018: 82) as collected at "N'Djamena ["Fort Lamy"], Nov 1919 (fl)."

MATERIALS AND METHODS

The present study is based on specimens at C (Fig. 1), ETH, and K as listed in the Appendix, on the literature reviews, and on field observations by the first author in Ethiopia during 1995–2005. Due to the scarcity of specimens, particularly of flowering and fruiting material, sterile North Eastern Tropical African material has also been identified, using the vegetative characters of Johnson and Murray (2018: 38–39, 126). Records from forest surveys without preserved specimens (Getinet et al. 2024 – central part of study area: 7.6500 N, 34.2375 E; Feyera et al. 2007 – central part of western lowland part of the Sheko forest: 7.1256 N, 35.3958 E) are also accepted as documentation and mapped.

As far as possible, georeferencing of specimens and records from the literature have been made and tested with Google Earth Pro vs. 7.3.6.9796 (64-bit) (https://www.google.com/earth/about/versions/2024, accessed April 2024). Ugandan specimens were georeferenced with the index of Polhill (1988). The 1930s collections from the Jebels around the Nuba Mountains and from

Figure 1. A specimen, *I. Friis, Zerihun Woldu & K. Vollesen* 2485 (C), of *Xylopia nilotica*, collected between the villages Pugnido and Gog south of Gambela in the western lowlands of Ethiopia. The scale belongs with the specimen to the left; to the right a detail of leaves magnified ca. x 3, showing the reticulate secondary and tertiary venation of the adaxial side of lamina.

Bar el Ghazal were georeferenced from the historical maps of Sudan in 1:250,000 (no. 55-M, 66-E, and 78-E, as digitized by the US Library of Congress, https://www.loc.gov/item/87692353/, accessed April 2014. Specimens from South Sudan west of the Nile were georeferenced from Reid (1952: map on p. 37). Mapping for Fig. 2 and 3 in this work was done with DIVA-GIS 7.5 (https://diva-gis.org/download, accessed March 2024). Modelling of potential distributions was made with MaxEnt 3.4.4. (Phillips et al. 2006; Phillips et al. 2024; software downloaded from https://biodiversityinformatics.amnh.org/open_source/maxent/, accessed March 2024). Coordinates for the localities for *Xylopia longipetala* and *X. holtzii* used in our modelling were acquired from the KML-files of Johnson and Murray (2018; Supplementary material I). The environmental data used for the modelling was the climatic data from BioClim 1–19, covering the years 1970–2000 and with a resolution of 30”, almost equivalent to a pixel size of 1 km² (https://www.worldclim.org/data/bioclim21.html, accessed March 2024).

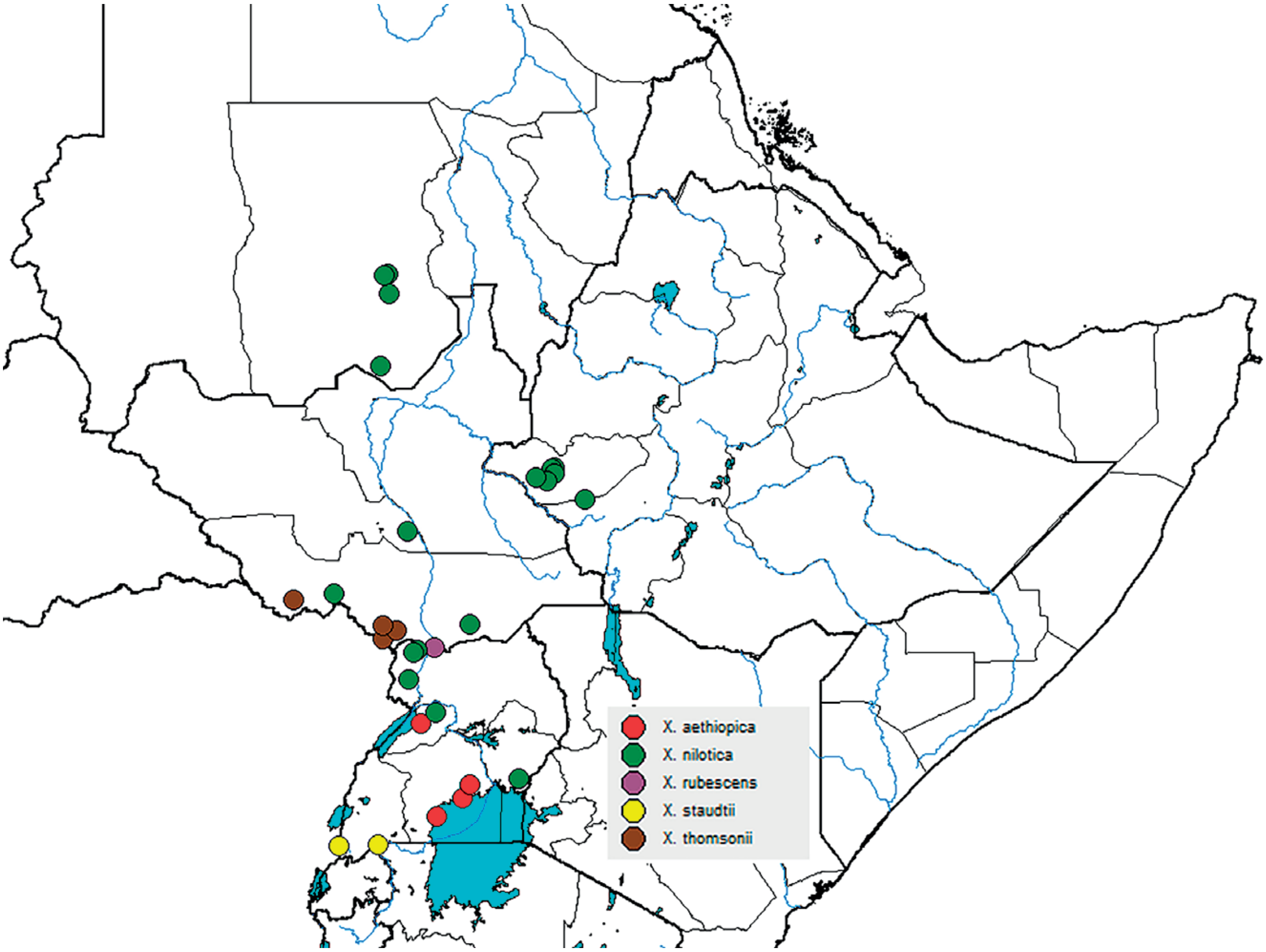

Figure 2. The distribution of species of *Xylopia* recorded from North Eastern Tropical Africa (Uganda, South Sudan, Sudan, and Ethiopia), only showing the distribution of the species within that area: *X. aethiopica* (red) occurs westwards to Senegal. *X. nilotica* (green) is endemic within the area shown on the map. *X. rubescens* (violet) occurs westwards to Guinea, on the map, only the record from Uganda is shown, two records from South Sudan are covered by a group of three records of *X. thomsonii*. *X. staudtii* (yellow) occurs westwards to Sierra Leone. *X. thomsonii* (brown) occurs westwards to Nigeria. The thick black lines indicate country boundaries. The thin blue lines are rivers; the thin black lines indicate the floristic boundaries of Verdcourt (1971, 2000) and Darbyshire et al. (2015). The southernmost region of South Sudan is the Equatoria region, divided in a western and an eastern part by the Nile.

The map in Fig. 3 was produced by superimposing our records of *X. nilotica* with DIVA-GIS on a simplified version of Frank White's vegetation map of Africa (White 1983), using a shapefile produced by ICRAF / World Agroforestry Centre at http://www.landscapesportal.org/layers/geonode%3Aafrica_white. (Accessed April 2024). In the conservation assessment, the preliminary evaluation of the EOO and AOO was made with GeoCAT (https://geocat.iucnredlist.org/, accessed April 2024). The evaluation of threats to the populations followed https://www.iucnredlist.org/resources/redlistguidelines (accessed April 2024). The information about protected areas is from https://www.protectedplanet.net/en (accessed April 2024).

RESULTS AND DISCUSSIONS: SPECIES, MAPPING AND MODELLING, HABITATS, AND CONSERVATION

Species

The following is a summary of the species of *Xylopia* in North Eastern Tropical Africa with the data mentioned in *Materials*. Classification, sequence of species, key and synonymy follow Johnson and Murray (2018), with addition of new information from the sterile material studied from South Sudan and Ethiopia. The cited altitudinal ranges cover only the ranges in North Eastern Tropical Africa; if altitude was not indicated on specimens, then the ranges were estimated from altitudes of the localities on Google Earth.

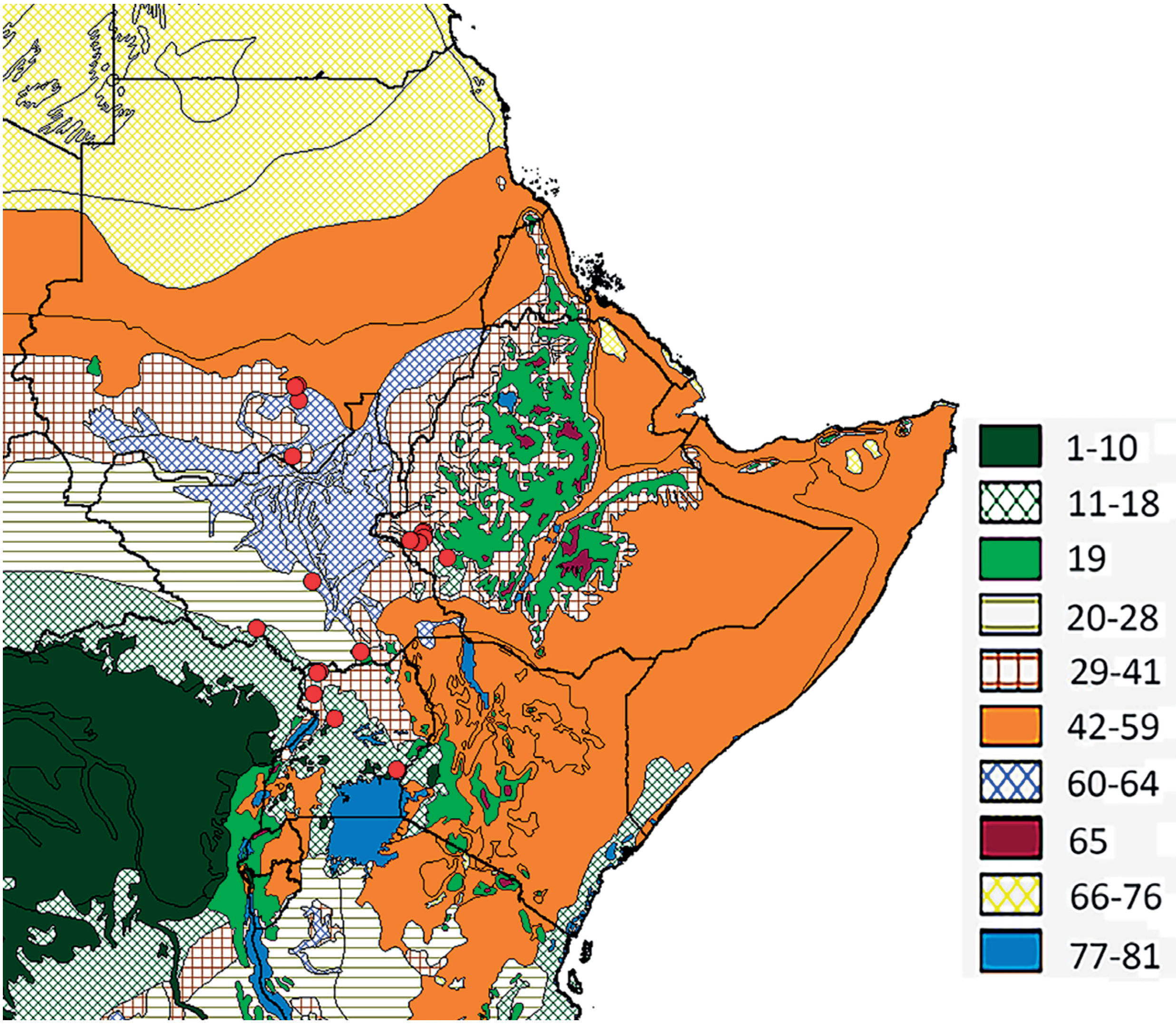

Figure 3. The distribution of *Xylopia nilotica* (circular red dots) superimposed on the northeastern part of White's vegetation map (map and legends simplified from White 1983). The thick black lines indicate country boundaries; the thin black lines indicate the borders between the full set of White's 81 vegetation types here assembled in ten groups marked with colouring and hatching as in the legend. For vegetation types of Frank White from which *X. nilotica* has been recorded and not been recorded, see the text in the section *Habitats*, where the numbers of the legend are also explained.

Identification with the following key (data from Johnson and Murray 2018) will mostly require flowering or fruiting material, but some vegetative characters may be used. The East African coastal species *Xylopia holtzii*, from outside North Eastern Tropical Africa but related to *X. nilotica*, is included here.

1. Seeds arillate, sarcotesta absent; nodes with either one or two axillary branches; staminal cone [the cone- or ring-shaped structure surrounding the carpels] rudimentary or absent, if well-developed then rim of cone even and carpels and monocarps more than 22 (sect. *Xylopia* and sect. *Neoxylopia*).. 2

–. Seeds not arillate, but a fleshy sarcotesta present on the seed (waxy layer that scratches off); some nodes with two axillary branches; staminal cone well developed but usually with an irregular laciniate rim, carpels and monocarps never more than 22, often many fewer (sect. *Stenoxylopia)*....................... 4

2. Aril not bilobed, carpels and monocarps up to 15 per fruit; staminal cone absent or rudimentary in the form of a ring only covering the bases of the carpels; leaves short-acuminate (up to 6 mm long) or, if longer, then sharply cuspidate, not gradually acuminate (section *Neoxylopia*); tall trees 3

–. Aril bilobed, carpels and monocarps up to 36 per fruit; staminal cone well developed, completely enclosing the ovaries; leaf gradually long-acuminate, the acumen 6–20 mm long (sect. *Xylopia*); tall trees; in study area only in Uganda... 3. ***X. aethiopica***

3. Outer petals much longer than inner petals; mature monocarps strongly torulose [with alternate swellings and contractions], often moniliform [resembling a string of beads]; tall trees; in study area in South Sudan and Uganda……………….. ....1. ***X. rubescens***

–. Outer and inner petals subequal in length; mature monocarps torulose or not, but not moniliform; in study area only in Uganda .... 2. ***X. staudtii***

4. Most pedicels with 3–6 bracts, these often imbricate and more or less persistent, even in fruit; pedicels 1 or rarely 2 per axil (sect. *Stenoxylopia*, *Xylopia acutiflora* group); shrub or small tree, sometimes lianesque; in study area only in South Sudan...................................... 5. ***X. thomsonii***

–. Most pedicels with 2 bracts, these often separated and with the upper persistent in flower and the lower caducous, not usually present in fruit; pedicels 1–12 per axil (some inflorescences with >1 pedicel); smaller or larger trees 5

5. Higher-order veins equal in prominence to the secondary veins, forming a conspicuous raised reticulum on the adaxial surface; larger leaf blades 6.5–9.2 cm long; monocarps conspicuously verrucose but not much wrinkled, stipe 3.5–5 mm thick at the midpoint; endemic in the study area, in Ethiopia, Sudan, South Sudan, and Uganda ......4. ***X. nilotica***

[–. Higher-order veins less prominently raised than the secondary veins, forming only a faint reticulum on the adaxial surface; larger leaf blades 7.4–11.4 cm long; monocarps obliquely wrinkled and minutely verrucose (visible with hand lens), stipe 3-3.5 mm thick at the midpoint; East African endemic, only in coastal Kenya and Tanzania ....***X. holtzii***]

Xylopia sect. ***Neoxylopia*** Engler & Diels (1901).

1. *Xylopia rubescens* Oliv., Fl. Trop. Afr. 1: 30. 1868.

Eggeling and Dale (1951: 23); Verdcourt (1971: 76); El Amin (1990: 14); Johnson and Murray (2018: 48).

Tall tree to ca. 25 m tall. DBH up to 70 cm (Johnson and Murray 2018: 49). Mainly in riverine forest or swampy places in mixed woodland and forest (Verdcourt 1971: 76), up to ca. 800 m a.s.l. Map of distribution in North Eastern Tropical Africa in Fig. 2.

Distribution

Guinea, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, South Sudan, Equatorial Guinea, Gabon, Republic of the Congo, Democratic Republic of the Congo, Uganda, Tanzania, Angola, Zambia, Mozambique.

2. *Xylopia staudtii* Engler & Diels, Notizbl. Königl. Bot. Gart. Berlin 2: 298. 1899.

Verdcourt (1971: 75); Hamilton (1981: 148); Johnson and Murray (2018: 56).

Very tall tree up to 35 (–50) m, DBH up to 80 cm (Johnson and Murray 2018: 56). In tall lowland forest up to 1350 m. Map of distribution in North Eastern Tropical Africa in Fig. 2.

Distribution

Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea, Gabon, Republic of the Congo, Democratic Republic of the Congo, Uganda, Angola.

Xylopia sect. ***Xylopia***

3. *Xylopia aethiopica* (Dunal) A.Rich. in R.de la Sagra, Hist. Phys. Cuba, Pl. Vasc.: 53. 1841.

Verdcourt (1971: 76); Hamilton (1981: 148); El Amin (1990: 13); Darbyshire et al. (2015: 72–73); Johnson and Murray (2018: 76). *X. eminii* Engler (1895): Eggeling and Dale (1951: 22).

Tall tree, commonly 15-30 m. DBH up to ca. 60 cm (Johnson and Murray 2018: 76). In moist lowland forest, often secondary, but rarely cultivated (Johnson and Murray (2018: 76), up to ca. 1200 m a.s.l. Map of distribution in North Eastern Tropical Africa in Fig. 2.

Distribution

Gambia, Guinea Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon, Central African Republic, São Tomé & Principe, Equatorial Guinea, Gabon, Republic of the Congo, Democratic Republic of the Congo, Uganda, Kenya, Tanzania, Angola, Zambia, Malawi, Mozambique, Zimbabwe. Johnson and Murray (2018) also indicate record from Chad, but that is based a d'Alleizette specimen and should be deleted according to the information about these collections (a d'Alleizette specimen and should be deleted (Johnson and Murray pers. com).

Xylopia sect. ***Stenoxylopia*** Engler & Diels (1901).

4. *Xylopia nilotica* D.M.Johnson & N.A.Murray, PhytoKeys 97: 126. 2018.

X. parviflora auct., non *X. parviflora* Spruce (1860: 6), nec *X. parviflora* (A.Rich.) Benth. (1862: 479), *nom. illeg.*: Eggeling and Dale (1951: 23); Verdcourt (1971: 79); Hamilton (1981: 148); El Amin (1990: 14); Friis (1992: 94); Woube (1995: 73, 76); Friis and Vollesen (1998: 66); Verdcourt (2000: 7); Senbeta et al. (2007: 34); Friis et al. (2010: 107–108, 178); Masresha et al. (2024: 6, 10, 12).

[*X. parviflora* auct., non Vallot (1882: 219), *nom. illeg.*]

X. vallotii auct., non *X. vallotii* Chipp ex Exell (1926: 8), *nom. nud*., non Hutch. and Dalziel (1927a, b): Broun and Massey (1929: 50); Andrews (1950: 7).

X. longipetala auct., non De Wild. & T.Durand (1899: 4): Darbyshire et al. (2015: 72–73); Friis et al. (2022: 201).

Shrub or tree up to 25 m; DBH 50 cm (or more). In a range of vegetation types from open lowland forests, sometimes in Ethiopia with *Baphia abyssinica*, sometimes in South Sudan in forest patches in U-shaped valleys with *Khaya grandifoliola* and *Cola grandifolia*, in riverine forest, and in dense and open high rainfall woodlands with *Terminalia* spp. and *Anogeissus leiocarpa; a*ssociates of *X. nilotica* listed in Johnson and Murray (2018) were *Holoptelea grandis*, *Milicia excelsa*, as well as species of *Khaya*; 420-1020 m a.s.l. Wood much used by Anuak population (Woube 1995). Map of distribution in North Eastern Tropical Africa in Fig. 2; distribution imposed on part of the vegetation map of Africa by White (1983) in Fig 3; modelled potential distribution in Fig. 4B.

Distribution

Uganda, South Sudan, Sudan. The records from South Sudan east of the Nile and Ethiopia represent sterile material identified on the diagnostic characters from Johnson and Murray (2018: 126).

5. *Xylopia thomsonii* Oliver, Fl. Trop. Afr. 1: 31. 1868.

Johnson and Murray (2018: 207).

X. sp. aff. *X. oxypetala* (DC ex Dunal) Engl. & Diels (1901): Broun and Massey (1929: 50).

X. acutiflora auct., non (Dunal). A.Rich.: Andrews (1950: 7); El Amin (1990: 13); Darbyshire et al. (2015: 72–73).

Shrub or small tree to ca 10 m, sometimes lianesque; DBH up to ca. 17.5 cm (Johnson and Murray 2018: 207). Possibly in high rainfall woodlands and certainly in damp places in lowland forests at altitudes below 1000 m a.s.l. Map of distribution in North Eastern Tropical Africa in Fig. 2.

Distribution

Nigeria, Cameroon, Central African Republic, South Sudan, Gabon, Republic of the Congo, Democratic Republic of the Congo, Angola.

Mapping and diversity of Xylopia *species*

The mapped distributions in Fig. 2 of all species of *Xylopia* in North Eastern Tropical Africa show that the species, apart from *X. nilotica*, are restricted to Uganda and the Equatoria province of South Sudan to the west of the Nile. Species richness per quarter or one degree square has been analysed, and is found to be low. We found generally no or one species in each square, except for two species per square the areas in Equatoria province just west of the Nile. As appears from Fig. 2, most of the *Xylopia* species in North Eastern Tropical Africa occur in Uganda and along the Congo-South Sudan border west of the Nile. The fact that there are few quarter or one degree squares with more than one species can most likely be explained with the fact that North Eastern Tropical Africa is marginal in relation to the distribution of *Xylopia* in Africa, and the few quarter or one degree squares with one record, mostly *X. nilotica*, must be due to these areas having been poorly collected, as explained in the section *Xylopia in floristic and ecological literature on North Eastern Tropical Africa*.

Habitats

Johnson and Murray (2018: 26, 27, Fig. 5) point out that the majority of African *Xylopia* species occupy lowland tropical wet forest below 1000 m, which is a typical habitat for Annonaceae worldwide, and that the greatest concentration of species is found in the high rainfall countries of Cameroon and Gabon. *Xylopia longipetala* and *X. rubescens* are riparian species, but the former does not occur in North Eastern Tropical Africa; *X. rubescens* appears to be a widespread and generally opportunistic wetland species, which in North Eastern

Tropical Africa is only known from the southernmost South Sudan and nearby Uganda. The distribution of *X. aethiopica*, a secondary forest species used as a spice and a medicinal plant, has likely been augmented by human activity, but is mostly collected from secondary habitats, and is known to be locally cultivated; in North Eastern Tropical Africa, it is only known from Uganda.

In Fig. 3, the distribution of *X. nilotica* is shown on a simplified presentation of the vegetation types of White (1983). All records occur in a peripheral position to the large, swampy area (the Sudd) along the Nile (the core area of the Nile Basin with White's vegetations no. 61, *Edaphic grassland in the upper Nile basin*, no. 62, *Edaphic grassland mosaic with Acacia wooded grassland*, and no. 64, *Edaphic grassland mosaic with semi-aquatic vegetation*). The habitats of *X. nilotica* are also outside the dense lowland forests of the Congo Basin. The literature and specimen records from South Sudan and Western Ethiopia are from habitats where lowland forests form a mosaic with wooded and secondary grassland, open riparian vegetation, open forest, forest-woodland mosaic, and from open woodland with *Anogseissus leiocarpa*, a dominant species in Sudanian woodland across Africa from the Atlantic Coast to Ethiopia and Eritrea (Friis et al. 2022: 216).

The vegetation types, in which *X. nilotica* has been found, are: *Mosaics of lowland forests and woodlands and secondary grasslands* (11–18; *X. nilotica* is recorded from 11a, *Mosaic of lowland rain forest and secondary grassland – Guineo-Congolian). Dense types of woodlands, including Sudanian Isoberlinia woodlands* (20–28; *X. nilotica* is recorded from 27, *Sudanian woodland with abundant Isoberlinia). Open types of woodlands, including open Sudanian and Ethiopian woodlands* (29–41; *X. nilotica* is recorded from 29a, *Undifferentiated woodland – Sudanian*, 29b, *Undifferentiated woodland – Ethiopian*, and 35b, *Transition from undifferentiated woodland to Acacia deciduous bushland and wooded grassland – Ethiopian*). *Xylopia nilotica* seems to be absent from the dense *Guineo-Congolian lowland forests* (1–10), all types of *Afromontane vegetation* (19) and *Altimontane (Afroalpine) vegetation* (65), and the lowland vegetation south and east of the Ethiopian highlands, the *Somalia-Masai Acacia-Commiphora deciduous bushlands and Sahel Acacia wooded grassland and deciduous bushland* (42–59). *Xylopia nilotica* only marginally intrudes into the *Moist edaphic grasslands of the Nile Valley* (60–64), and it completely avoids the swampy Sudd vegetation along the Nile itself. *Xylopia nilotica* is also completely absent from *Desert and halophytic vegetation* (66–76), and *Mangroves and inland lakes* (77–81).

Modelling of Xylopia longipetala*,* X. nilotica*, and* X. holtzii

Because the species of *Xylopia* distinguished by Johnson and Murray (2018) as *X. longipetala*, *X. nilotica*, and *X. holtzii* were previously considered conspecific and named *X. parviflora* (e.g. by Verdcourt 1971: 79; 2000: 7), we have modelled their distribution and the potential suitability of their habitats across Africa with MaxEnt (Fig. 4A, B, & C). The scale indicating variation in suitability ranges from Dark Green (lowest suitability 0.0) to Dark Red (highest suitability 1.0).

Fig. 4A shows that the most suitable areas for *X. longipetala* is West Tropical Africa from Cameroon and the Republic of Congo and westwards. However, areas with actual records and areas with suitability up to 0.6–0.8 occur in the Central African Republic and in the northern part of the Democratic Republic of Congo.

Fig. 4B shows that the most suitable areas for *X. nilotica* is western Ethiopia, the Equatoria province of South Sudan, large parts of Uganda, and the western parts of Kenya near Lake Victoria (the species has not yet been recorded from Kenya). The records from around the Nuba Mountains in Sudan occur in small areas with a suitability above 0.8 or between 0.6 and 0.8. A possible explanation for the records in this area with relatively low suitability could be that the trees on the *jebels* around the Nuba Mountains grow under more favourable local conditions than detected by the modelling. Such ecological variation over short distances is part of the definition of the vegetation type 'hill catena', which Harrison and Jackson (1958) mapped around the Nuba Mountains and on the western slopes of the Ethiopian Highlands. That there may be more favourable ecological conditions for forest in valleys was also described by Jackson (1956: 356) from the Imatong Mountains.

Another observation possible to make on the models is that although both sides of the watershed between the Nile and the Congo River seem to have conditions highly suitable for *X. nilotica*, the actual distribution of the species seems to be restricted to north of this watershed and only to the west of the Nile-Omo watershed. We cannot suggest why watersheds seem to be distributional barriers for *X. nilotica,* unless we assume that the species is restricted to dispersal along streams, but that would not agree with the dispersal of seeds of *Xylopia* by vertebrates, which in the studied species are attracted by the brightly coloured arils or sarcotesta exposed in open fruits (Johnson and Murray 2018: 21–22). However, there is no information about which animals may disperse *X. nilotica*, which has no aril but a red to orange sarcotesta in vivo. In Fig. 2, it can be seen that – unlike for *X. nilotica* – a number of West African species of *Xylopia*

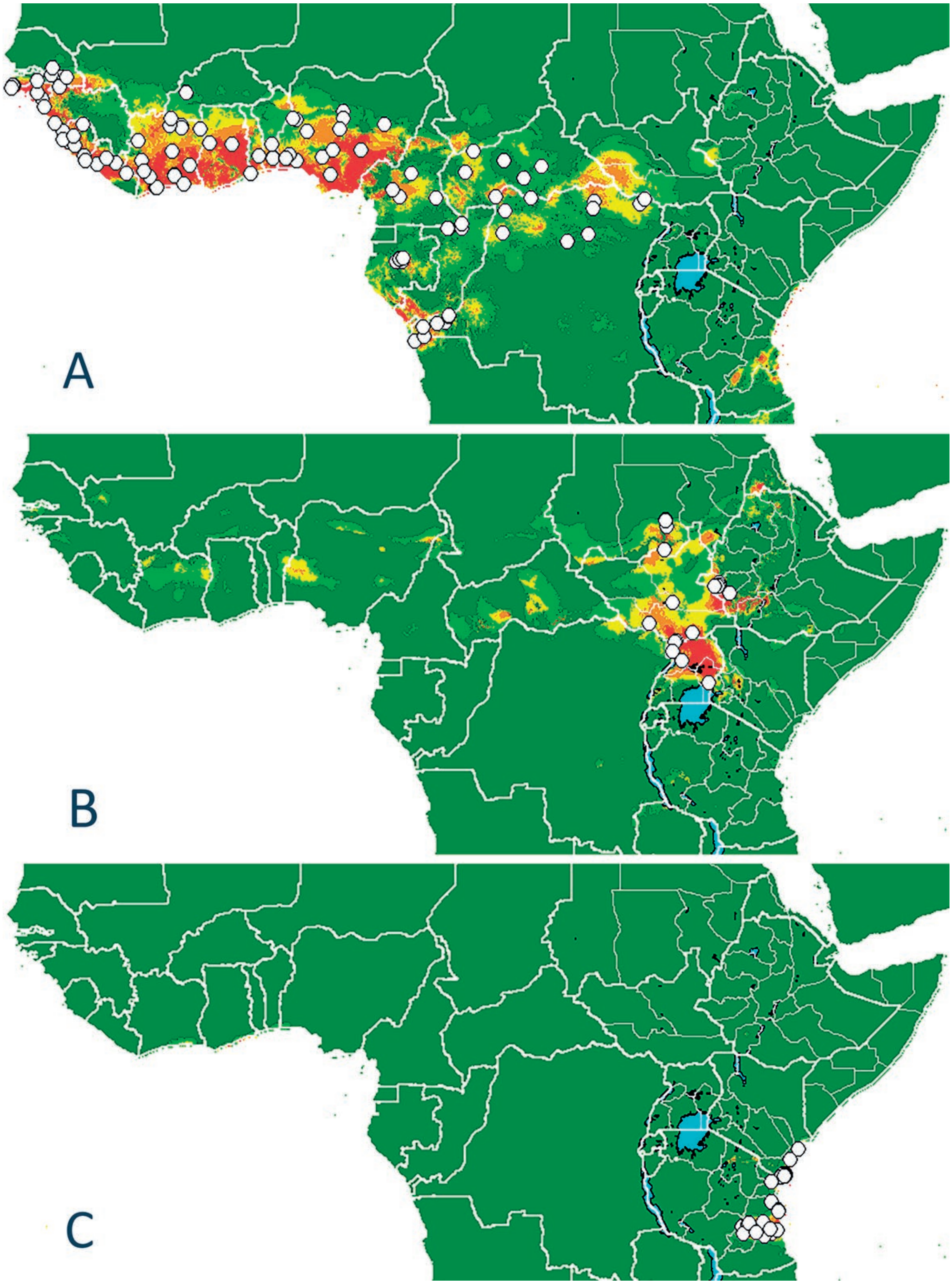

Figure 4. Maps of the actual (white dots) and potential distribution (shown by a gradient from dark green to dark red) of three species of *Xylopia,* previously regarded as conspecific and named *X. parviflora* (A.Rich.) Benth. (A) *X. longipetala*. (B) *X. nilotica.* (C) *X. holtzii*. The thick white lines are borders between countries, the thin white lines indicate the flora regions used in Darbyshire et al. (2015) and Verdcourt (1971; 2000). The colours in all three models indicate: Dark green: suitability 0.0–0.2. Pale green: suitability 0.2–0.4. Yellow: suitability 0.4–0.6. Orange: suitability 0.6–0.8. Dark red: suitability 0.8–1.0

cross the watershed from the Congo to the Nile Basin and penetrate a short distance into the western Equatoria region.

Fig. 4C shows that the known distribution of *X. holtzii,* the closest relative of *X. nilotica*, covers the entire area of the potential distribution of this species.

Fig. 4A, B, & C show that nowhere the known or potential distributions of *X. nilotica* and *X. holtzii* overlap, but along the Congo-Nile watershed to the west of the Nile there is a small area where the known distributions of *X. longipetala* and *X. nilotica* are very close and the potential distributions slightly overlap.

Xylopia nilotica *and patterns of endemism in North Eastern Tropical Africa*

An interesting result of this study is the observation that *Xylopia nilotica* is a species endemic to the combined countries Ethiopia, Sudan, South Sudan, and Uganda, all with parts of the White Nile and its tributaries, and that the distribution of this endemic species overlaps the borders between three of Frank White's phytogeographical regions: III. Sudanian regional centre of endemism, XI. Guinea-Congolia/Sudania regional transition zone, and XII. Lake Victoria regional mosaic (White 1983: Fig. 4). However, *Xylopia nilotica* has its widest distribution in the Sudanian region. Without modifications of the software, the international databases (Global Biodiversity Information Facility (https://www.gbif.org/), Enumération des plantes à fleurs d'Afrique tropicale (https://africanplantdatabase.ch/, or RAINBIO https://gdauby.github.io/rainbio/download_page.html) do not allow search for species present in Ethiopia, Sudan, South Sudan, and Uganda combined, and absent in all other countries, and therefore we have not with certainty been able to identify other species with a parallel distribution and span of phytogeographical regions.

Before the recognition of *Xylopia nilotica*, Darbyshire et al. (2015: 28, Table 3.2) studied endemism in Sudan and South Sudan, listing 86 taxa believed to be endemic to Sudan and South Sudan and also species with distribution restricted to Sudan, South Sudan, and one or a few neighbouring countries. Only one taxon was listed as occurring in South Sudan and Ethiopia, and none was restricted to Sudan, South Sudan and Uganda or to Sudan, South Sudan, Uganda and Ethiopia. If this list is complete, there is no endemic with a distribution similar to that of *Xylopia nilotica*.

Generally, local endemism is low in the distribution area of *Xylopia nilotica*. Linder (2001) mapped endemism in 2½ degree grid-cells in the whole of mainland Africa and calculated weighted endemism on a scale from 1 to 10 for each cell. In North Eastern Tropical Africa, only grid cells in the highlands of Ethiopia, along the border between Ethiopia and Somalia, and next to the Albertine Rift scored a weighted endemism of 2 or more, the remaining cells scored only 1, while zero weighted endemism was scored for most of the Sudan and the northern and central part of South Sudan. Demissew et al. (2021), studying endemism in Ethiopia based on the floristic units used in the Flora of Ethiopia and Eritrea, found the highest endemism in the Ethiopian highlands and in the eastern lowland near Somalia; there was very low endemism in the western lowlands near Sudan and South Sudan.

Xylopia nilotica as endemic to the combined countries Ethiopia, Sudan, South Sudan, and Uganda is therefore, as far as we can see, unique, in being a relatively widespread endemic in an area where local endemics are few and near-endemics spanning two or more countries are rare.

Conservation status of Xylopia nilotica

Johnson and Murray (2018: 30) point out that while some African species of *Xylopia* are widespread, over half of the species on the continent have limited distributions and are vulnerable or potentially threatened. However, their analyses for the 24 least widely distributed species do not include X. *nilotica*. A later assessment of that species is presented by Cosiaux et al. (2019), based on the records from Uganda, South Sudan, and Sudan west of the Nile, and assuming an altitudinal range of 760–1220 m a.s.l. They published an extent of occurrence (EOO) of 246,813 km², an area of occupancy (AOO) of only 32 km², and an assessment of threat as Vulnerable B2ab(iii,iv). Category B2 was estimated due to the limited Area of Occupancy, (a) due to the area being *Severely fragmented*, and (b) due to (iii) *Continuing decline observed, estimated, inferred, or projected … in area, extent and/or quality of habitat,* and (iv) *number of locations or subpopulations low*. They state that in Uganda, the species is threatened by habitat loss due to forest clearance for farming (Nakakaawa et al. 2011).

Woube (1995) provided the most detailed statements about threats to the populations of *X. nilotica* in Ethiopia. The wood is much used by the Anuak for making dug-out canoes, mortars and other tools; the tree must be 10–15 years before it can be used, but, as stated by Woube, the demand is high, so there are few mature trees left in either the resettlement areas or in the mechanized farm sites. The resettlements expanded quickly during 1975–1984, when 80,000 drought-stricken farmers from the highlands were moved to the lowlands. Many new resettlements were planned in 1984–1986, after which the numbers declined. However, after the resettlements, the threat to the natural vegetation increased when big, mechanized farming-schemes were initiated. In the 1980s, the large-scale farming started with state farms mechanized for mass production of oil seeds, cotton, sugar cane and other tropical agricultural products, and, after the failure of the Ethiopian state farms in the late 1980s, foreign investment in big agricultural schemes has continued. Due to civil unrest in South Sudan, the lowlands south of Gambela received large numbers of refugees settled in vast refugee camps. For a review of threats to the western lowland vegetation of Ethiopia, see Friis et al. (2022: 53).

Xylopia nilotica is recorded from some protected areas. Cosiaux et al. (2019) mention two in Uganda: the Murchison Falls National Park and the Ajai Wildlife Reserve. In South Sudan, the species is reported from the Kinyeti Valley just outside the Imatong Forest Reserve. In Ethiopia, *X. nilotica* is reported from the Gambela National Park, but the park has been severely encroached by settlements and big-scale farming. In the Sheko National Forest Priority Area, where the species is infrequent, nothing is known about threats, except from expansion of coffee-growing areas.

Our analysis of all the now known records of *X. nilotica* with Google Earth resulted in an extended altitudinal range of 420–1250 m a.s.l. Analysis of our distributional data with GeoCAT (https://geocat.iucnredlist.org/) resulted in a larger extent of occurrence (EOO) than that of Cosiaux et al. (2019), now ca. 490,000 km^2. According to GeoCAT, this suggested a category of threat of Least Concern (LC). In spite of the distribution being extended to Ethiopia and South Sudan East of the Nile, the estimated area of occupancy (AOO) was only slightly larger than that indicated by Cosiaux et al. (2019), ca. 52 km^2 with a cell-size of 2x2 km. According to GeoCAT, this suggests a category of threat of Endangered (EN). However, the threats to *X. nilotica* under category B remain the same as for the estimate of Cosiaux et al. (2019), and it is not possible to state that *X. nilotica* meets any of the criteria A and C to E for the category Endangered (EN). Therefore, although the Imatong and Ethiopian locations were previously not considered, we think it reasonable to retain the category Vulnerable (VU). In making this assessment, we also consider that we in this work consider *X. nilotica* to be undercollected, and that it should be noted that, apart from Ethiopia, there are no recent or relatively recent collections, and that many colections (all Ethiopian) are sterile.

ACKNOWLEDGEMENTS

We thank the Herbarium C for permission to reproduce *Friis & al.* 2485 and Hannah May Elvery for the scan. Stephen Harris, Herbarium FHO / Daubeny Herbarium, University of Oxford, provided a scan of *Jackson* 763. Melaku Wondefrash, Herbarium ETH, Addis Ababa University, provided images of their material of *X. nilotica*. Maria Alvarez kindly provided images of material of *Xylopia* at Herbarium K. Herbarium acronyms as in Thiers (continuously updated).

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APPENDIX

Specimens observed from North Eastern Tropical Africa

Xylopia rubescens Oliv., Fl. Trop. Afr. 1: 30. 1868.

UGANDA. Amua River, West Madi, May 1948 (fl), *Eggeling* E.5775 (K - 3.6167° N, 31.8167° E). **SOUTH SUDAN.** Equatoria, Yei, Libogo, Khor Ini, 19 Nov 1940 (st), *Myers* 13586 (K – 3.8267° N, 30.6027° E); Libogo, Yei, 27 Nov 1940 (fr), *Myers* 13598 (K – 3.8267° N, 30.6027° E).

Xylopia staudtii Engler & Diels, Notizbl. Königl. Bot. Gart. Berlin 2: 298. 1899.

UGANDA. Impenetrable Forest, Kigezi, Apr 1946 (fl), *Butt* 45 (ENT, not seen, photo at K - 1.0833° S, 29.5833° E); [U2], Rukungiri District, Kayonza, Bwindi forest, Ishasha Gorge, 0°53'–1°08'S, 30°25'–30°35'E, 1350 m, Apr 1998 (fl), *Hafashimana* 0504 (K – 1.0333° S, 30.5000° E).

Xylopia aethiopica (Dunal) A.Rich. in R.de la Sagra, Hist. Phys. Cuba, Pl. Vasc.: 53. 1841.

UGANDA. Entebbe District, 3900 ft., 1904, *Dawe* 118 (K); Bujeje District, 3600 ft, 1905 (fl, fr), *Dawe* 229 (K); Masaka District, NW side of Lake Nabugabo, 1140 m, 9 Oct 1953 (fl, fr), *Drummond & Hemsley* 4714 (B, EA, FI-T, K—2 sheets); Namanve, Mengo, 3700 ft., Jan 1935 (fr), *Eggeling* 1524 (BR, K—indicates *Eggeling* 1583 to be a wood collection of this number, but duplicates at EA and NY bear only the number 1583); without definite locality, 1922 (fr), *Maitland* s.n. (K).

Xylopia nilotica D.M.Johnson & N.A.Murray, PhytoKeys 97: 126. 2018.

UGANDA. Northern Region, Leya and Aiyu river junction, W. Madi, 25 Mar 1945 (fl, fr), *Greenway & Eggeling* 7251 (holotype: EA; isotypes: K, PRE - 3.563575° N, 31.419057° E); West Nile, Koich River, Rumogi, Mar 1935 (fl), *Eggeling* 1650 (K - 3.502779° N, 31.346995° E); Madi, 830 m, Feb 1961 (fl), *Philip* 931 (EA, K - 2.861307° N, 31.220318° E); Murchison Falls National Park, Rabongo Forest, 02°06' N, 31°52' E, 1020 m, 1 May 1993 (fl, fr), *Sheil* 1443 (K - 2.1000° N,31.8667° E); Busoga District, Igwe mutalla, 10 mi S of Bugiri, 1260 m, 20 May 1951 (fl), *Wood* 610 (EA, K—2 sheets - 0.5126°N, 33.8177°E). **SOUTH SUDAN**. [Bahr el Ghazal, on label:] Equatoria [in fact Bar el Ghazal], Tior, Aliab country, small tree frequent in *Anogeissus* woodland, vernacular name "Bo" (Aliab Dinka), 13 Nov 1938 (st), *Myers* 10102 (K – 6.3775° N, 31.1782° E); West Equatoria, "Large tree of Azza Forest," 28 Apr 1933 (fr), *Smith* 39 (K - 4.8918° N, 29.4609° E); East Equatoria, Torit Dist., Imeila Forest, 4° 10' N, 32° 40' E, 750 m, forest with *Khaya grandifoliola* and *Cola grandifolia*, tree to 80 ft and 24 inch DBH with straight bole and small, round buttresses to 7 ft, 27 May 1949 (st), *Jackson* 763 (FHO, KHF - 4.16667° N, 32.66667° E). **SUDAN**. South Kordofan, Jebel Eliri, 13 Jan 1908 (st), *Broun & Broun* 1373 (K - 10.2834° N, 30.5667° E); Gebel Amira, Nuba Mts., 16 Apr 1930 (buds), *Simpson* 7778 (K—2 sheets - 12.2500°

N, 30.73334° E); Jebel El Dair, vernacular name Dooru (?, many languages around Jebel Dair), Mar 1936 (st), *Longe* 40 (K - 12.4667° N, 30.7167° E); Eastern Kordofan Province, Jebel Dair, 4000 ft, 17 Jul 1937 (fl), *Turner* 241 (K - 12.4667 N, 30.7167 E). **ETHIOPIA**. Tree 5 cm DBH, Height 4 m, Abobo to Gog, 34° 25' E, 7° 40' N, 1600 ft., vernacular name *Orwyee* (Anuak), Feb 1976 (st), *Chaffey & Thomerson* 658 (K - 7.5794° N, 34.5018° E); Illubabor, c. 7 km S of Abobo, 650 m., woodland, tree to 10 m (st), 21 Apr 1982 (st), *Friis & al.* 2485 (C [Fig. 1], ETH, K - 7.8672° N, 34.6022° E); Gambela, Ukuna kijan, evergreen thicket and forest, swampy area along stream, 420 m, tree, DBH ca. 50 cm, 27 Dec 1990 (st), *Woube* 15 (ETH - 7.8975° N, 34.6590° E); Abobo-Gog Forest, Dumbong, 82 km S of Gambela towards Gog, 7° 44.261' N, 34° 39.420' E, 580 m, common in lowland semi-deciduous forest dominated with *Baphia abyssinica*, vernacular name *Orway* (Anuak), tree to 6 m, DBH 3 cm, 14 Oct 2000 (st), *Simon, Getachew & Hagere* 1002 (ETH - 7.7378° N, 34.6569° E). Records from forest surveys without preserved specimens (Getinet et al. 2024 – central part of study area: 7.6500 N, 34.2375 E; Feyera et al. 2007 – central part of western lowland part of the Sheko forest: 7.1256 N, 35.3958 E) have been mapped.

Xylopia thomsonii Oliver, Fl. Trop. Afr. 1: 31. 1868.

SOUTH SUDAN. SW Equatorial Province, Aloma Plateau, ca. 1 mile SSW of Iwatoka, 23 Mar 1939 (fl), *Hoyle 823* (BM, K – 3.8356° N, 30.6120° E); Korobe Forest, Yei District, Equatoria, 2 Jul 1958 (st), *Jackson* 3894 (K – 4.0298° N, 30.9228° E); Nabambisso, 19 Feb 1870 (bud, fr), *Schweinfurth* 3032 (K – 4.7500° N, 28.4833° E); Lado, Yei River, Asugi, 23 Oct 1919, *Sillitoe* 353 (K – 4.1617° N, 30.6120° E); Lado, Yei River, 10 Nov 1919 (fl), *Sillitoe* 479 (K – 4.1617° N, 30.6120° E).