

# Phytogeography of the genus *Microcos* L. (Malvaceae, Grewioidae) in Africa

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**Abstract:** The aim of this study was to determine the number of species of the genus *Microcos* in African countries. Species of this genus are confined to wet equatorial forests and mountain forests. Therefore a centre of diversity of the genus *Microcos* in Africa is found in the Democratic Republic of the Congo. Areas of lower species richness are Cameroon, Nigeria, Tanzania and Uganda. Several types of distribution patterns of species of *Microcos* were distinguished.

**Kew words:** *Microcos*, Malvaceae, phytogeography, Africa, distribution, diversity

The genus *Microcos* was described by Linnaeus (1753). Later on, it was included into the synonymy of the genus *Grewia* as a separate section (Burret 1910, 1911, 1926). *Microcos* is distinguished by its preference for wetter habitats, such as equatorial forests and tropical mountain forests, while *Grewia* contains mainly mesophytes. The section *Microcos* was divided by Burret (1910, 1911) into 3 subsections: *Intergristipulae*, *Digitatae* and *Pinnatifidae*.

The genus *Microcos* contains about 60 species distributed mainly in the Indo-Malaysian region and in Africa, where it is represented by 18 species. These are usually trees with undivided leaves. Flowers are numerous, small and hermaphroditic, growing in panicles composed of a large number of 3-flowered cymes. In contrast, flowers of the genus *Grewia* are conspicuous, with large sepals covered with stellate hairs. Fruits are drupaceous. Species of *Microcos* are used as food (fruits) or as material for bows and traps as well as other tools. They are also used in medicine and witchcraft of African tribes (Dalziel 1937).

The genus *Microcos* is in need of a critical revision of its taxonomy and phytogeography (Bayer & Kubitzky 2003). It lacks a holistic revision, as the last one was published in the 1920s (Burret 1926). So far there are also no publications concerning its phytogeography.

Because our knowledge of the genus *Microcos* is so poor, it seemed to be interesting to start its study with a determination of the number of *Microcos* species in African countries. No exact information concerning their distribution was available before. Such an approach helped also, to some extent, to recognize centres of diversity of the genus, as well as gaps in our knowledge of its distribution in Africa. Further studies of taxonomy and phytogeography of the genus *Microcos* in Africa are under way.

Data concerning the distribution of *Microcos* species originated from 2 types of sources: (i) the literature listed in Table 1; and (ii) our database. The database contains information on 876 herbarium specimens from the following herbaria: BR, CO, K, MO, POZG, UPS, WRS, WAG, which were on loan to Poznań. Information concerning the countries of origin was taken from the herbarium labels, but identification of each specimen was verified by using standard methods of  $\alpha$ -taxonomy.

Our study has revealed that the centre of diversity of the genus *Microcos* in Africa is in the Democratic Republic of the Congo, with 15 species (Fig. 1). This country is covered with wet equatorial forests, preferred by these plants. Areas of lower species richness are Cameroon (8 species) and Nigeria (5) in Western Africa, where the same type of vegetation occurs. Several

species are also found in Tanzania (6) and Uganda (5), but in montane forests.

This study shows, however, that our knowledge of the distribution of the genus *Microcos* in Africa is not complete. The lack of data concerning *Microcos* in Burundi and Benin as well as gaps in the distribution of some species in the Republic of the Congo, Rwanda and Malawi, shall be considered as resulting from a lack of collections, rather than a real absence of this genus in their floras.

One can distinguish several types of distribution patterns of the species of the genus *Microcos* in the African countries (see Table 1). The most common species, occurring in 10 countries, are: *M. malacocarpa* Mast. and *M. barombiensis* K. Schum. Four species are endemic: *M. adolfi-friderici* Burret and *M. evrardii* R. Wilczek, both found only in the Democratic Republic of the Congo, *M. gilviflora* Excell in Zambia, and *M. transzambesica* Wild. in Mozambique. Seven species are distributed in Western, Central and Eastern Africa, few spreading south to Mozambique (e.g. *M. barombiensis*). Some of them show quite a disjunct distribution

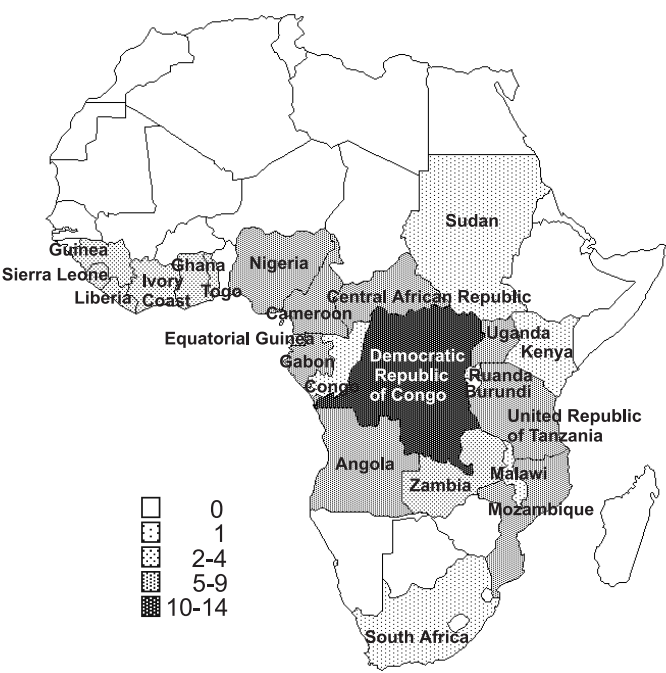


Fig. 1. Map showing numbers of species of the genus *Microcos* found in African countries

Table 1. Species of *Microcos* found in individual African countries (where literature not cited, information based only on herbarium data)

<i>Microcos</i> species	Sierra Leone (2, 3, 4, 14)	Liberia (4, 14)	Ivory Coast (18)	Ghana (8)	Togo (4, 11, 14)	Nigeria (1, 4, 14, 18)	Cameroon (4, 14, 18)	Central African Republic	Sudan (18)	Equatorial Guinea (3, 4, 14, 18)	Gabon (3, 4, 14, 18)	Republic of Congo	Dem. Rep. of Congo (2, 3, 4, 5, 6, 14, 16, 17, 18, 20)	Rwanda (10)	Uganda (18)	Kenya (7, 12)	United Republic of Tanzania (4, 14, 18)	Angola (3, 14, 18, 19)	Zambia (13, 16, 18)	Malawi	Mozambique (9, 13, 14, 15)	South Africa (9)	Total countries
<i>malacocarpa</i>	•	•	•	•	•	•	•	•		•			•										10
<i>malacocarpoides</i>		•			•	•	•	•	•		•	•	•										6
<i>oligoneura</i>						•	•	•	•		•	•	•										6
<i>pinnatifida</i>							•	•			•	•	•										2
<i>africana</i>	•	•					•	•			•	•	•		•								6
<i>coriacea</i>						•	•	•		•	•	•	•			•	•						7
<i>barombiensis</i>			•	•		•	•	•			•	•	•				•	•	•				10
<i>floribunda</i>				•									•		•			•	•				4
<i>conocarpoides</i>							•					•	•				•		•				4
<i>sereti</i>							•	•				•	•		•		•	•					5
<i>mildbraedii</i>								•				•	•	•	•		•			•			6
<i>adolphi friderici</i>												•	•										1
<i>evrardii</i>												•	•										1
<i>louisii</i>												•	•										2
<i>schmitzii</i>												•	•						•				2
<i>calymmatosepala</i>															•	•	•						3
<i>conocarpa</i>																•			•				2
<i>gilviflora</i>																			•				1
<i>transzambesica</i>																					•	•	1
<i>microthyrsa</i>																					•	•	2
Total species	2	3	2	3	2	5	8	4	1	2	5	2	15	1	5	1	6	4	4	1	4	1	

(e.g. *M. floribunda*). Four species occur only in Western and Central Africa (e.g. *M. malacocarpa*). *M. louisii* R. Wilczek is distributed only in Central and East Africa, while *M. schmitzii* R. Wilczek in the Democratic Republic of the Congo and Zambia. Species limited to East and South-East Africa are: *M. calymmatosepala* and *M. conocarpa*. Only *M. microthyrsa* reaches far south, from Mozambique to the South Africa.

During the examination of the herbarium material we noticed that many specimens had not been identified to species. Therefore it can be postulated that not only more fieldwork in the under collected areas, but also a taxonomic verification is needed for this genus in Africa. We now conduct such studies on the taxonomic classification of *Microcos*, based on  $\alpha$ -taxonomy.

## References

- BAYER C. & KUBITZKI K. 2003. Malvaceae. In: K. KUBITZKI & C. BAYER (eds.). The Families and Genera of Vascular Plants, vol. V, Flowering Plants, Dicotyledons: Malvales, Capparales and Not-betain Caryophyllales, pp. 225-311. Springer-Verlag Berlin-Heidelberg-New York.
- BEENTJE H. J. 1994. Kenya trees, shrubs and lianas. 722 pp. National Museums of Kenya, Nairobi.
- BURRET M. 1910. Verwandtschaftsverhältnisse und Verbreitung der afrikanischen *Grewia*-Arten, mit Berücksichtigung der übrigen. Bot. Jahrb. Syst. 44: 198-237.
- BURRET M. 1911. Die afrikanischen Arten der Gattung *Grewia* L. Bot. Jahrb. Syst. 45: 160-203.
- BURRET M. 1926. Beiträge zur Kenntnis der Tiliaceen. Notizbl. Bot. Gart. Berlin-Dahlem 9: 592-797.
- EXELL A. W. & MENDONÇA F. A. 1951. Malvaceae – Aquifoliaceae. Conspectus florae Angolensis 1(2): 177-422. Junta de Investigações do Ultramar, Lisboa.
- DALE I. R. & GREENWAY P. J. 1961. Kenya trees and shrubs. 654 pp. Buchanan's Kenya Estates Ltd., Nairobi.
- DALZIEL J. M. 1937. The useful plants of West tropical Africa. 612 pp. The Crown Agents for the Colonies, London.
- DE WILDEMAN E. 1908. *Grewia*. Ann. Mus. Congo Belge, Bot., Sér. V, 2: 298-300.
- DE WILDEMAN E. 1910. *Grewia*. Ann. Mus. Congo Belge, Bot., Sér. V, 3: 227.
- DE WILDEMAN E. 1919. Tiliaceae. Bull. Jard. Bot. de L'Etat 5: 341-349.
- DURAND T. & SCHINZ H. 1896. Études sur la flore de L'État Indépendant du Congo. 368 pp. Hayez, Imprimeur de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique, Bruxelles.
- IRVINE F. R. 1961. Woody plants of Ghana with special reference to their uses. 868 pp. Oxford University Press, London.
- LEJOLY J. & LISOWSKI S. 1978. Plantes vasculaires des Sous-Regions de Kisangani et de la Tshopo (Haut – Zaire). 128 pp. Faculté des Sciences de l'Uanza, Campus de Kisangani.
- LEUENBERGER B. 1984. Tiliaceae. In: J. F. BRUNEL, P. HIEPKO & H. SCHOLZ (eds.). Flore analytique du Togo. 751 pp. Deutsche Gesellschaft für Technische Zusammenarbeit, Eschborn.
- LINNAEUS C. 1753. Species plantarum. 1200 pp. Salvius, Stockholm.
- MASTERS M. T. 1868. Tiliaceae. In: D. OLIVER (ed.). Flora of tropical Africa, 1, pp. 240-268. Reeve and Co., London.
- PALMER E. & PITMAN N. 1972. Trees of Southern Africa covering all known indigenous. Balkema, Cape Town, 2: 1427-1447.
- SPRAGUE T. A. 1909. The section *Omphocarpus* of *Grewia* in Africa. Kew. Bull. 22: 18-22.
- TROUPIN G. 1982. Flore des plantes ligneuses du Rwanda. 675 pp. Musée Royal de l'Afrique, Tervuren.
- WILCZEK R. 1963a. Tiliaceae. In: W. ROBYNS (ed.). Flore de Congo, Rwanda et Burundi, 10, pp. 16-24. Jardin Bot. Belg., Meise.
- WILCZEK R. 1963b. Novitates Africanae VIII. Tiliaceae. Bull. Jard. Bot. Bruxelles 35: 459-471.
- WILD H. 1963. Tiliaceae. Flora Zambesiaca 2(1): 33-91.
- WILD H. & GONÇALES M. L. 1969. Tiliaceae. In: A. FERNANDES (ed.). Flora de Moçambique 28: 1-72.