The ORSTOM bambara groundnut collection

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Introduction

Cameroon lies on the edge of the Guinea Gulf, between West and Central Africa, and crosses both Guinean and Sudanian phytogeographical areas. All along this south-north axis, there is a continuous contrast between lowland and highland areas. Cameroon is the home of numerous ethnic groups, belonging to three different linguistic phyla, and material cultural traits are well conserved. These factors make Cameroon a valuable resource for ethnobotanic studies (Figs. 1, 2 and 3).

The ORSTOM-MESIRES project, 'Agrosystems and cultivated plant diffusion' was initiated and coordinated by Christian Seignobos. Within this project, a study of pulses was undertaken by the authors. Results on cowpea have been published (Pasquet and Fotso 1994) and results on *Phaseolus* beans are in preparation.

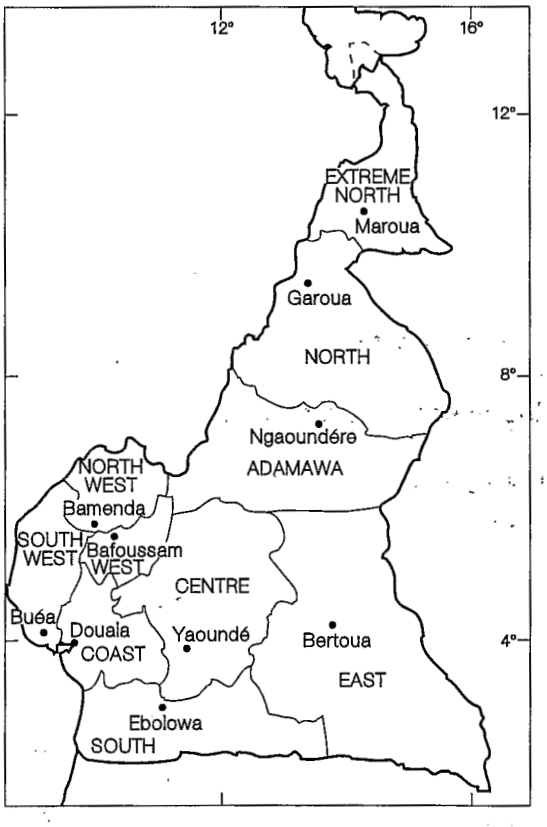

Fig. 1. Administrative map of Cameroon.

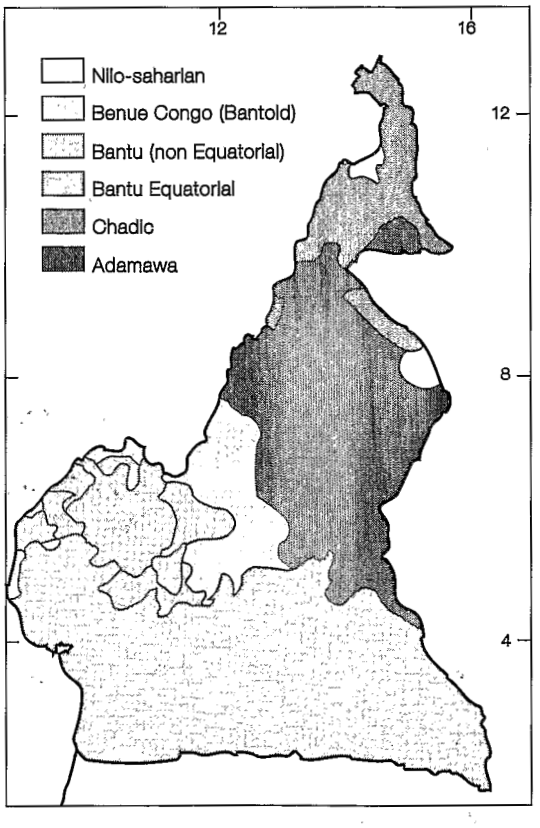

Fig. 2. Linguistic phyla of Cameroon.

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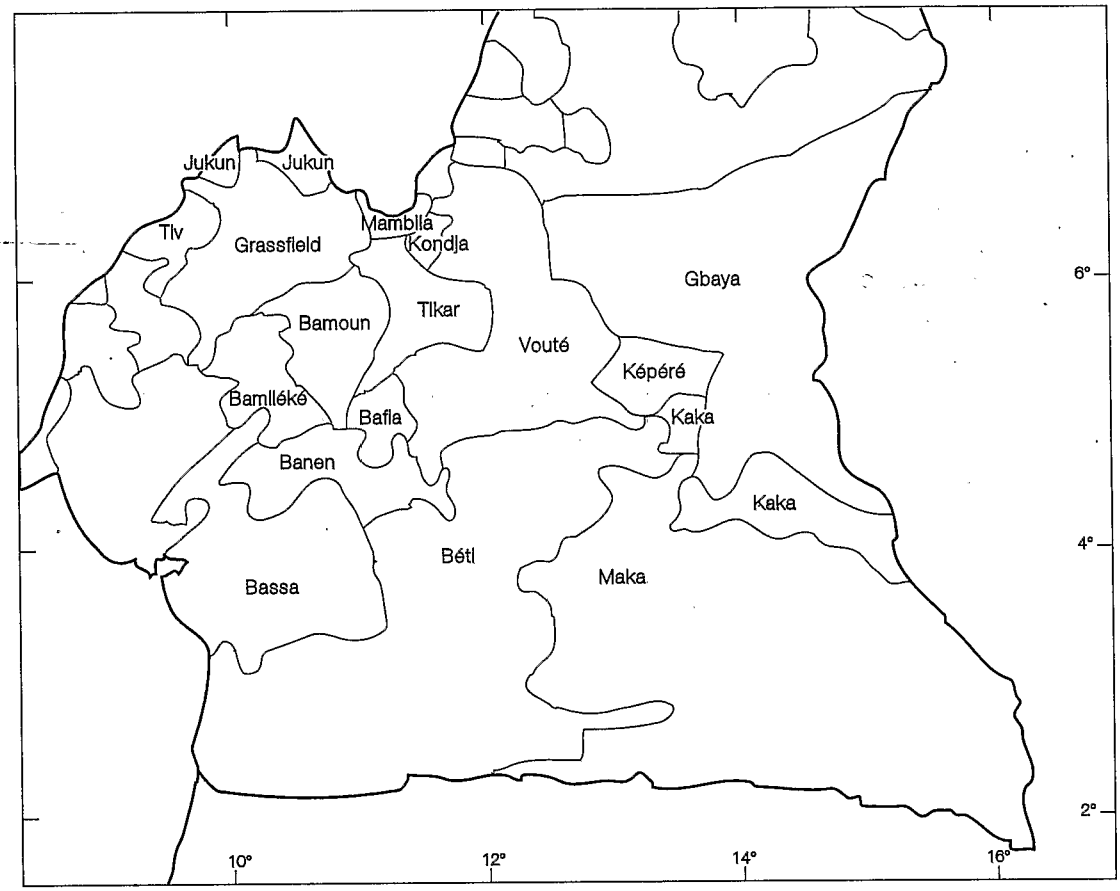

Fig. 3. Ethnic groups in south Cameroon.

Collecting

Pulse seed samples were collected in 893 localities (but only 702 localities yielded bambara groundnut samples). Collecting trips, lasting more than a total of 6 months, were undertaken by the authors during several dry seasons, between March 1985 and December 1989. The expected collecting density was one locality for every 100 km^2. However, this was often modified according to ethnolinguistic criteria. At the same time, seed samples were collected by village representatives from the following parapublic organizations:

- SODECOTON, Société de Développement du Coton, in the Nord and Extrême Nord provinces
- NEBBP, Nord-Est Bénoué Basin Project, in Nord province
- MIDENO, Mission de Développement du Nord-Ouest, in Nord-Ouest province
- UCCAO, Union des Coopératives de Café Arabica de l'Ouest, in Ouest province
- SODECAO, Société de Développement du Cacao, in Centre and Sud provinces.

A slight correlation between population density and density of localities sampled was observed. In highly settled areas – the northern Mandara mountains (densely surveyed because of the high variability encountered), southern Diamaré, and west Cameroon highlands – collecting density was high. On the other hand, poorly settled areas such as the southeastern forest areas and the savannas south of Adamaoua had a markedly lower collecting density.

Condition and size of the bambara groundnut collection

The collection presently includes approximately 1200 cultivated accessions (Table 1) from 702 localities (Fig. 4). However, many accessions are a mix of several different cultivars, which are not yet divided. When the mixed accessions are separated, the collection is expected to exceed 2000.

The collection also includes 60 wild and weedy accessions from 29 localities (Fig. 5). The map shows many more localities with wild and weedy bambara groundnut than previously known through herbarium specimens from K, P and YA herbaria. Wild bambara groundnut seems to be widely distributed, although rare, between 7°N and 11°N.

Table 1. Origin of Cameroonian bambara groundnut accessions.

	No. localities	No. accessions
Collecting trips		
Pasquet *et al.*	190	298
Parapublic societies surveys		
SODECOTON	227	533
NEBBP	60	111
MIDENO	24	26
UCCAO	27	32
SODECAO	174	219
Total	702	1219

Traditional landraces

According to seed colour, colour pattern, seed size and number of seeds per pod, accessions were assigned to approximately 30 different cultivars. Most cultivars are traditional landraces, but some large-seeded cultivars have been introduced during the last 20 years. No bred varieties seem to have been distributed by agricultural services, either before or after the independence of Cameroon.

Conservation techniques

A collection of 1-50 seeds per accession is now housed at ORSTOM, Montpellier (France) in a cold room at 5°C and 20% humidity.

Description of the range of diversity in the collection

A total of 50 accessions, including two weedy and one wild, were morphologically characterized. Analysis of the data produced the following results (see Table 2). As expected, the wild and weedy accessions show smaller leaves, smaller seeds (unfortunately, seed size was not accurately recorded), very long internodes and a spreading growth habit.

Most interestingly, cultivated accessions could be split into two distinct groups: a northern group, characterized by 1-seeded pods, and a southern group, characterized by 2-4 seeded pods, as those reported by Rassell (1960), a slightly less bushy habit, and more robust plants. This latter group does not seem to have been studied by Begemann (1988a).

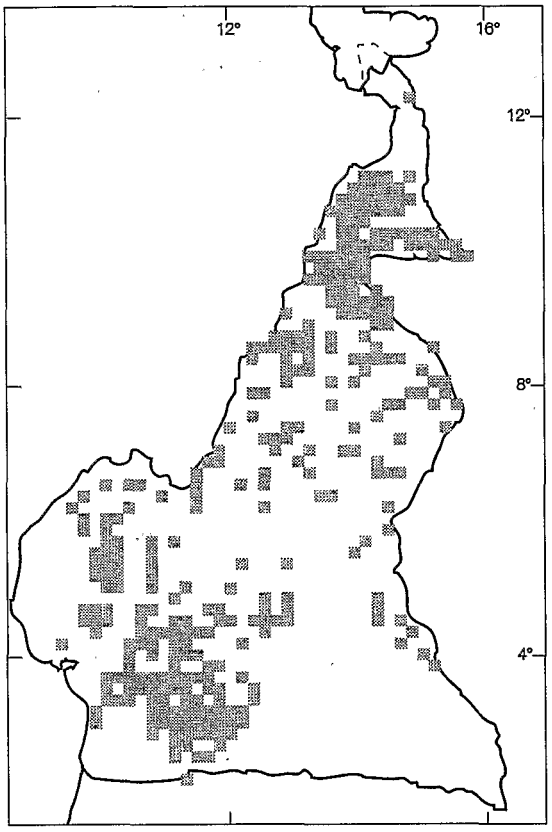

Fig. 4. Localities where bambara groundnut was sampled.

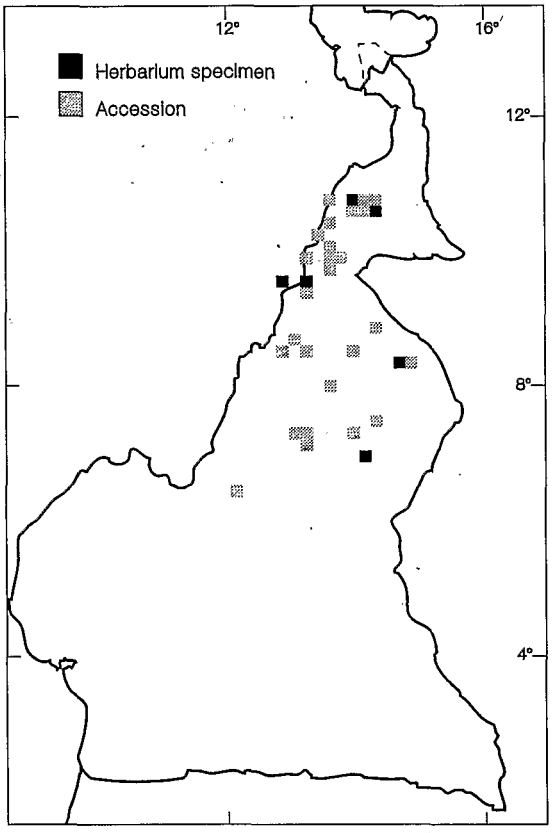

Fig. 5. Wild and weedy bambara groundnut: localities of previously known herbarium specimens and localities of recently collected accessions.

Table 2. Characterization results (Pasquet and Fotso, unpublished data)

	Accessions				
Character	Wild	Weedy	North	South	West
1st leaflet length (mm)	48.0	73.0	63.0 ± 7.0	64.1 ± 6.1	64.5 ± 7.4
1st leaflet width (mm)	9.0	18.0	18.2 ± 4.6	22.0 ± 2.0	25.5 ± 1.9
leaflet length (mm)	49.0	64.0	50.5 ± 6.3	63.4 ± 4.0	59.5 ± 2.7
leaflet width (mm)	16.0	13.0	22.3 ± 2.9	33.3 ± 3.6	33.6 ± 2.5
petiole length (mm)	53.0	82.5	85 ± 15	96 ± 21	142 ± 15
4th internode length (mm)	74.5	76.0	21.1 ± 7.4	22.8 ± 2.1	28.5 ± 4.0
stem number	–	–	6.3 ± 1.5	7.2 ± 1.9	8.5 ± 1.7
flower length (mm)	–	–	9.7 ± 0.6	10.2 ± 0.4	10.8 ± 0.3
flower width (mm)	–	–	8.38 ± 0.98	9.00 ± 0.36	9.02 ± 0.48
percentage of 1-seeded pods	100	97.6	90.9 ± 9.5	53.8 ± 12.8	49.8 ± 10.7

Other important issues

The border between the area of cultivation of these groups follows a line south of Adamaoua, which separates the two main areas of Cameroon: the northern (sorghum) area, where only one crop per year is viable, and the southern (maize) area, where two crops may be grown annually. A similar phenomenon is observed with cowpea. To the north of this line, the cultigroups *Biflora* and *Melanophthalma*

(which display low ovule numbers) are found, and to the south, the cultigroup *Unguiculata* (which displays high ovule numbers) (Pasquet and Fotso 1994). As cultigroups *Biflora* and *Melanophthalma* are photosensitive, and *Unguiculata* is photo-independent, it seems reasonable to suppose that the bambara groundnut cultigroups in the northern localities may be photosensitive and those in the south, photo-independent.

This frontier is also a cultural boundary between the Chadic and Adamawa linguistic groups of the north, and the Bantoid and Bantu linguistic groups of the south (Fig. 2). The ethnobotanical and linguistic data gathered suggest that bambara groundnut is associated with Adamawa, Bantoid and Bantu language speakers, and cowpea with the Chadic language speakers (Pasquet and Fotso 1991).

It is also interesting to note the three areas which are more or less devoid of bambara groundnut. There is no bambara groundnut in the flooded plains which surround Lake Chad. In precolonial times, bambara groundnut was imported for consumption, primarily from the Mandara mountains. Bambara groundnut was not cultivated and used by the ethnic groups from southwest Cameroon, perhaps because some of these groups were yam bean cultivators, and other groups relied on hunting for their protein needs. Bambara groundnut was not cultivated by the Béti, who expressed a preference for, and were proud of possessing, peanut. In this area, bambara groundnut cultivation is restricted to the former Bassa area, which was conquered by the Béti a few decades before the colonial period. Legumes are traditionally cultivated by women, and as the Béti kept the Bassa women, the existence of bambara groundnut in this region continues as remnant of the Bassa culture. Bambara groundnut is found throughout the Lophira alata forest area, which formed part of the once much more extensive Bassa region (Letouzey 1968).

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Bambara groundnut

Vigna subterranea (L.) Verdc.

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