

LARGE VARIATION OF OKRA COLLECTED IN BENIN AND TOGO

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During 1980 the IBPGR commissioned the Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM) to carry out a detailed study on the genetic resources of Abelmoschus species. The final report is now available in French (Charrier, 1983) and the English version will be published in due course. ORSTOM has also agreed to multiply, characterize and document Abelmoschus material, both from existing collections and that obtained through FAO/IBPGR multicrop collecting missions, especially in Africa. In this way most of the genetic resources of Abelmoschus will be fully documented before entering the IBPGR designated base collections for long-term conservation.

Siemonsma (1980, 1982) described a new species of Abelmoschus found in Ivory Coast and neighbouring countries. The main characteristics of this species are the six to eight epicalyx segments and the "perennial tendency". This form is supposed to be closely related to the "Guinean" climate areas and has been named A. sp. "Guinean" in contrast to the classic species A. esculentus, which is usually cultivated in "Sudanian" climatic areas.

In order to further study and preserve the genetic diversity of West African Abelmoschus species and landraces, a mission was carried out in Togo and Benin from 8 November to 22 December 1982, sponsored by the IBPGR. The following persons participated in the expedition: S. Hamon and A. Charrier (ORSTOM, Ivory Coast); K. Somana (Recherche Agronomique, Togo); and B. Hounsou and G. Degbelo (Recherche Agronomique, Benin).

This collecting mission explored Togo from Lome to Dapaon and Benin on a circular route from Cotonou to Malanville, Tanguieta, Djougou, and Cotonou, covering a total distance of 7500 km. The route followed and the collecting sites are presented in Figure 1.

The climate varies from the tropical rain forest in the region around Kpalime (Togo) to the Sudanian savannah near Malanville (Benin). Figure 2 indicates the provinces (Benin), regions (Togo) and the average annual rainfall.

Collections were made from farmers' stores, backyards and fields. For each sample two or more fruits (and in a few cases seeds) were collected from farmers' stores while bulk samples were obtained in backyards and fields whenever possible. A total of 718 samples was collected. A breakdown by province/region is presented in Table 1 and by species or types in Table 2.

The material collected in Togo was divided into two parts; one of which was deposited at the Cacavelli Station (Recherche Agronomique). In Benin the Direction de la Recherche Agronomique indicated that local facilities for storage and evaluation are not adequate and requested ORSTOM to conserve the entire collection. All material has been introduced in Ivory Coast and will be multiplied, characterized and documented during 1983/1984. Duplicate samples will be sent for long-term conservation to Fort Collins USA in 1984.

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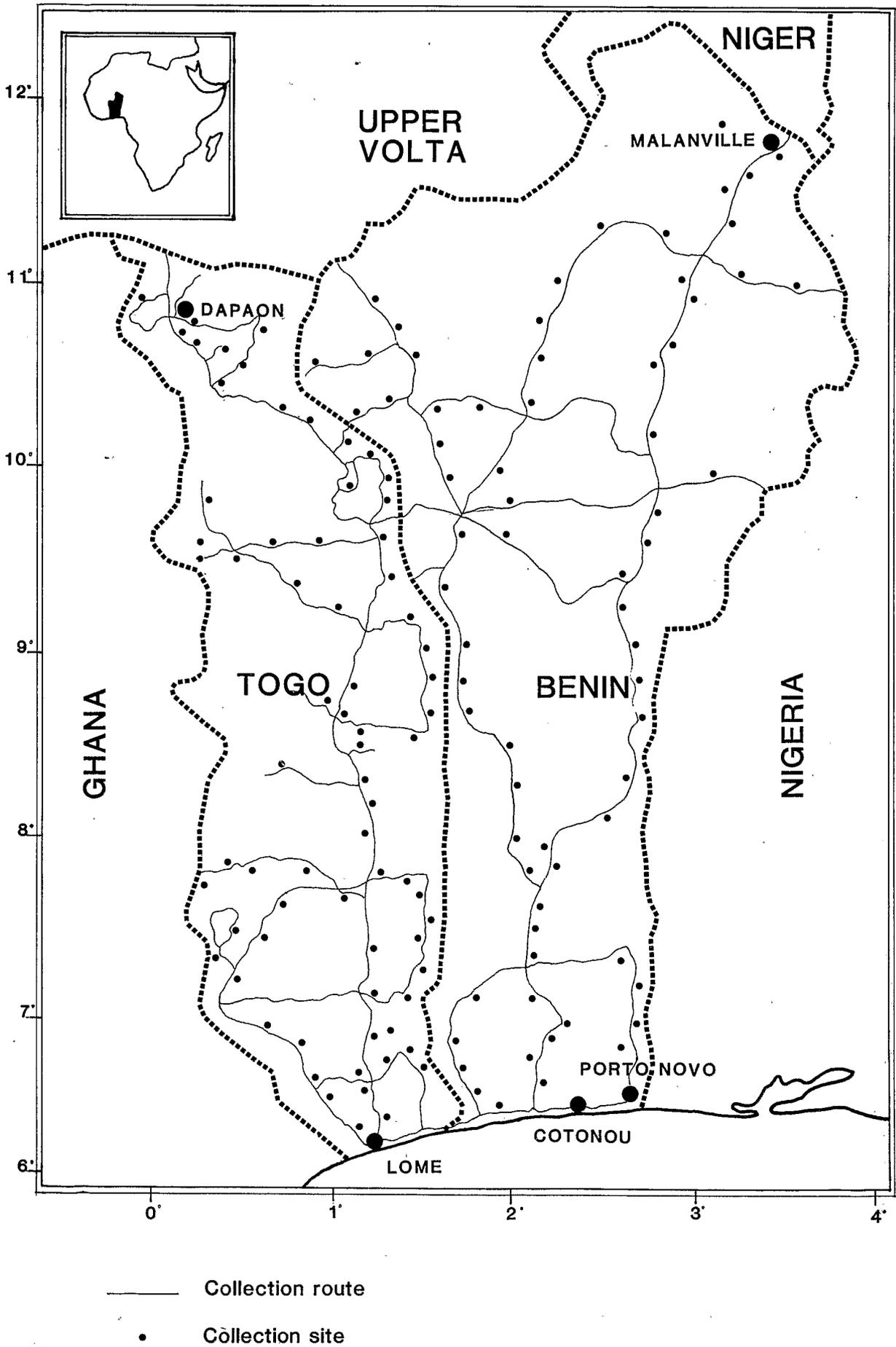


Fig. 1. Route followed and collecting sites

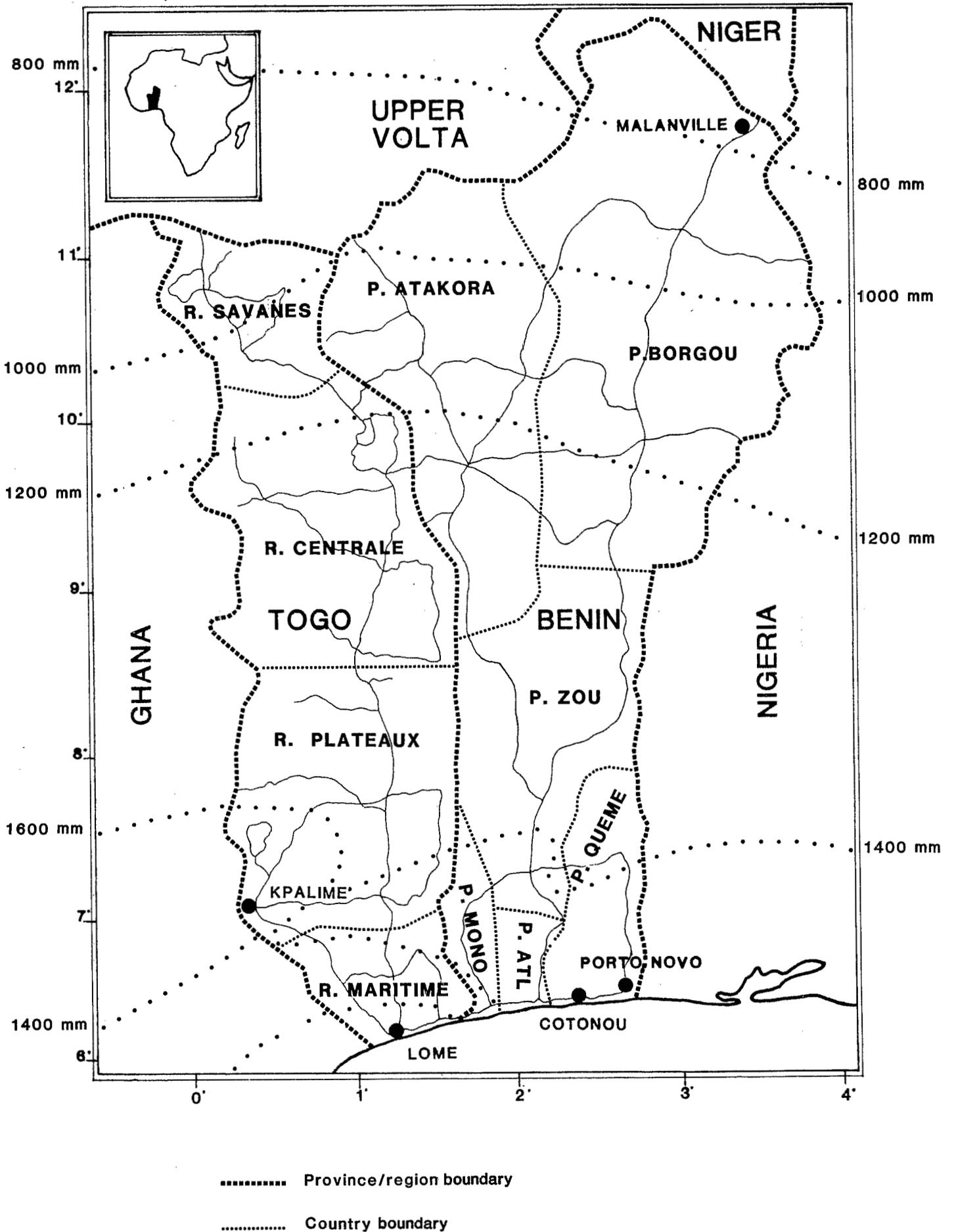


Fig. 2. Average annual rainfall in the provinces of Benin and the regions of Togo

Table 1. Number of Abelmoschus samples collected in different provinces (Togo) and regions (Benin)

Togo		Benin	
Maritime	60	Oueme	14
Plateaux	140	Atlantique	8
Centrale	127	Mono	22
Savanes	83	Zou	55
		Atakora	100
		Borgou	109
Total	410	Total	308

Table 2. Number of samples of Abelmoschus species and types collected

Species/type	Togo	Benin	Total
<u>A. esculentus</u>	192	162	354
<u>A. sp. "Guinean"</u>	183	84	267
<u>A. moschatus</u>	5	14	19
<u>A. (northern type)</u>	17	15	32
Undetermined	13	33	46
Total	410	308	718

Table 3. Classification of varietal types of A. esculentus

Varietal type	Fruit shape (see Fig.3)	Number of samples	Length of mature pods (cm)	Width of mature pods (cm)
Classical	A	175	6 - 15	1,0 - 2,0
Antelope horn	D	93	20 - 40	2,0 - 2,5
Unridged	E	6	20 - 30	2,0 - 3,0
Triangular	F	27	20 - 30	2,5 - 3,5
Monkey or Agouti check Unmarried man okra	G	53	8 - 13	3,5 - 5,0

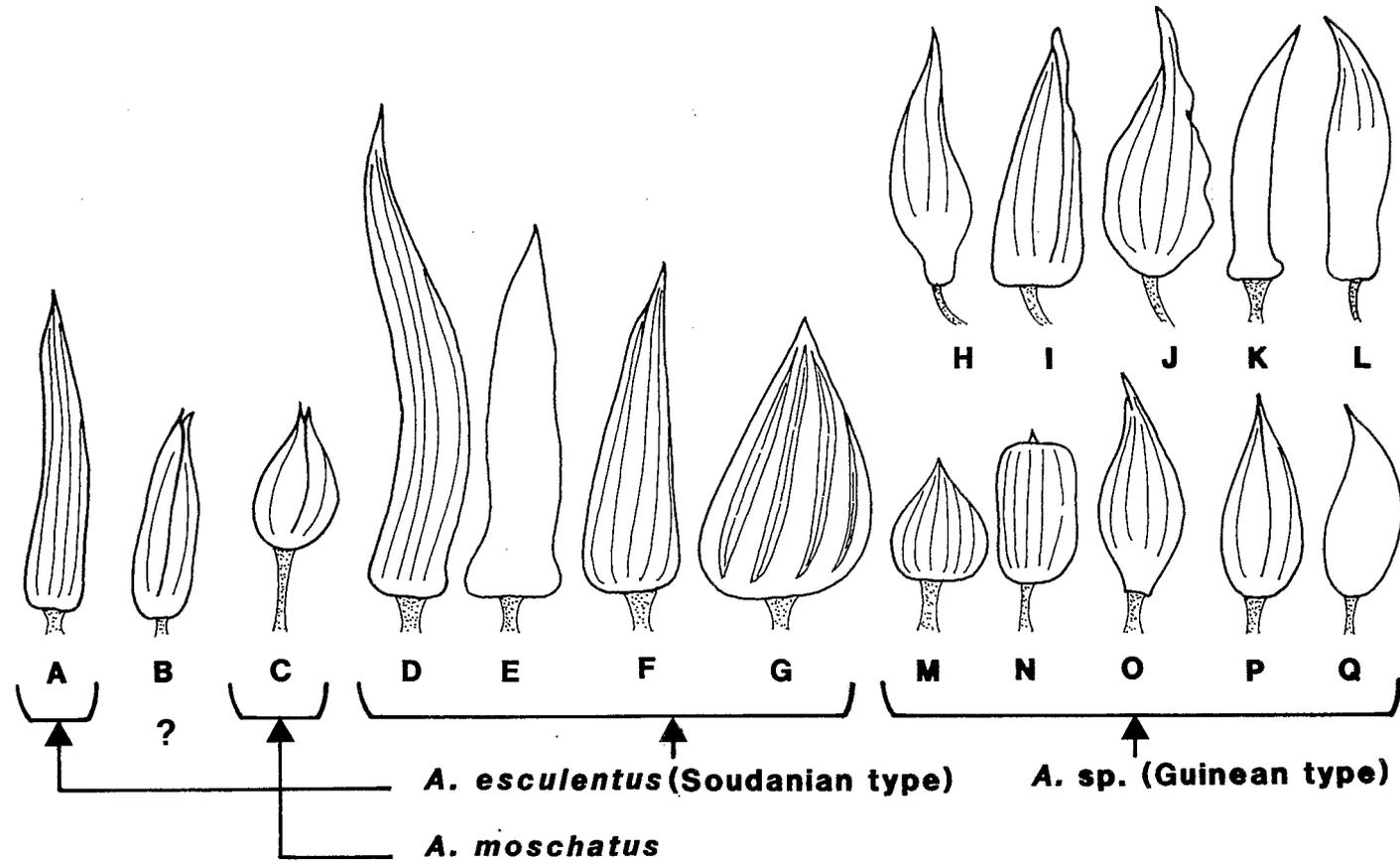


Fig. 3. Fruit shapes encountered in Togo and Benin

Information on material collected

Large variability has been observed and some information is provided below on the questions of polymorphism and traditional cultivation practices. This variability is expressed in, among other ways, the different fruit shapes encountered (Figure 3). Except in the case of A. moschatus, the risk of genetic erosion is fairly low.

"Sudarian" and "Guinean" forms: there is an equal distribution of A. esculentus and A. sp. "Guinean" in Togo, but A. esculentus is predominant in Benin. Both species are often cultivated together to assure a continued production of okra all year round. A. esculentus has a harvesting period which starts one month after sowing and continues for two or three months. A. sp. "Guinean" is sown at the same time as A. esculentus (or at a maximum one month later), but since it is a photosensitive species, it only produces vegetative growth during the rainy season and rarely starts producing fruits before the dry season. For this reason these species are named by farmers as "rainy season okra" and "dry season okra" respectively. If the dry season is severe the plants of A. sp. "Guinean" seem to die, but the first rains may be sufficient to induce new fructification on old nodes or stems ("perennial tendency").

The cultivation of both A. esculentus and A. sp. "Guinean" in the same field is more common between 8 and 11 degrees north latitude. In the seaside regions and around the cities, people prefer A. esculentus pods. In order to have a continuous production, this species is grown by market gardeners in swamps or under irrigation. Above 11 degrees north latitude, A. sp. "Guinean" is partly replaced by a special type described below.

The fresh young pods of the two species are directly consumed in both countries, but the entire or sliced pods of A. sp. "Guinean" can also be sun-dried. Similarly the leaves of this species are dried and conserved in bags made with sorghum leaves (Figure 4). In the northern part of Benin stems are bruised and exported to Niger.

A total of 354 samples of A. esculentus was collected and several distinct forms could be identified. These are described in Table 3.

The local name given by the farmers to A. sp. "Guinean" relates in 80 percent of the cases to the harvesting period; an exception being made for a special type (Figure 3 H to Q) but it seems that farmers do not pay special attention to this aspect and harvest all pods in bulk. Few forms are very hairy.

Northern form: particularly noteworthy is a northern type (Figure 3 B), which is exclusively encountered above 11 degrees north latitude. This type is not yet classified because of the particular epicalyx segments and fruit characteristics. Flowers have only seven epicalyx segments, which are thin and separated by wide intervals. Fruits are generally short and display two colours (five green ridges on a yellow or red background). This type is often cultivated in hedges near habitations and fruits during the dry season. Further studies on this special type are necessary.

A. moschatus: this species is not really cultivated and only 19 samples were collected. In the southern part of Togo and Benin it was found in the Ewe, Ouatchi, Adja, Mina and Aizo ethnic groups and it was associated with traditional animism practices in such a way that only some families can use fresh pods and sometimes leaves of A. moschatus seeds and other plant roots as a treatment against rheumatism.

Because of the secrecy associated with this species, it was difficult to obtain samples and reliable information. A. moschatus is always found in humid places or in places or in the middle of the farmyard between water jugs in the Borgou province (Figure 5). This species is the one most threatened by genetic erosion.

Cultural practices

Water is absolutely essential for the cultivation of A. esculentus during the entire growing cycle. This species is often grown in monoculture (market gardeners and farmers near a water point), but sometimes intercropped.

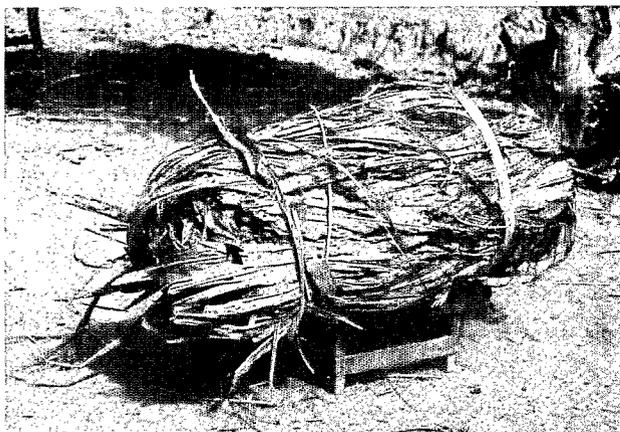


Fig. 4. Leaves of Abelmoschus conserved in a bag made up of sorghum leaves

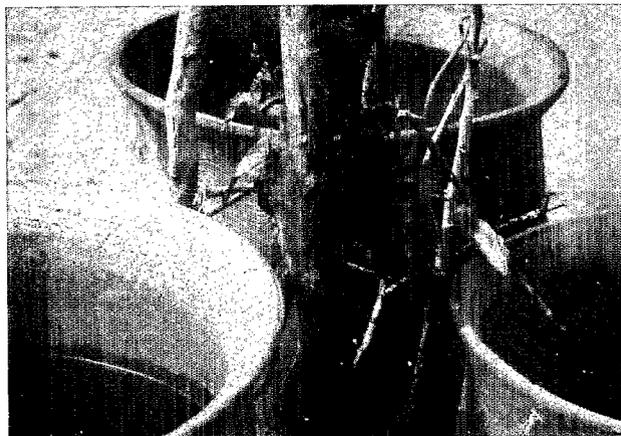


Fig. 5. A. moschatus between water jugs

In farmers' fields A. sp. "Guinean" is always cultivated in an intercropping system. The associated crops differ from the southern to the northern regions. In the southern regions A. sp. "Guinean" is intercropped with cassava, in the central parts with yams and in the northern regions with sorghum. Although these are the major associated crops, other combinations also occur, e.g. with tomato, rice, pepper, coffee, etc. Sometimes A. sp. "Guinean" is cultivated in backyards by women, a practice especially prevalent in the area around Lama-Kara in Togo. When A. sp. is associated with yams, plants are scattered in the fields on the side of planting mounds. One variety of A. esculentus is sown in September by farmers (Figure 5).

References

- Charrier, A. Des ressources génétiques d'Abelmoschus esculentus (Gombo) et des espèces apparentées. IBPGR (in press). 1983
- Siemonsma, J.S. Local okra cultivars from Ivory Coast. A note for the IBPGR. Centre 1980 Neerlandais, ORSTOM, Ivory Coast. 11 pp. (mimeographed).
- Siemonsma, J.A. La culture du Gombo (Abelmoschus spp.), légume-fruit tropical (avec 1982 référence spéciale à la Côte d'Ivoire). Thèse Landbouwhogeschool, Wageningen, The Netherlands. 297 pp.

RESUME

Une mission de collecte a parcouru 7,500 km au Bénin et au Togo pour récolter des échantillons d'espèce d'Abelmoschus en 1980. Sept cent dix-huit échantillons ont été récoltés. On a observé une grande variabilité qui s'exprime par les formes de fruits différents. Il ne semble y avoir à l'heure actuelle guère de danger d'érosion génétique, sauf dans le cas de A. moschatus.

RESUMEN

Una misión de recolección, que ha cubierto 7,500 km, se llevó a cabo en Benin y Togo para reunir la especie Abelmoschus en 1980. Se tomaron en total 718 muestras. Se observó una gran variabilidad, manifestada por la distinta conformación de los frutos. En la actualidad parece ser que no hay mucho peligro de una erosión genética, excepto en el caso de la A. moschatus.

RICE GERMPLASM CONSERVATION WORKSHOP

A two-day workshop, co-sponsored by the International Rice Research Institute (IRRI) and the IBPGR was attended by 35 scientists from 21 countries, 9 staff members from 6 other International Agricultural Research Centres and international agencies, and IRRI staff. Progress in field collection during the past five years (1977-82) was reviewed. Papers on conservation methodology, the wild species of *Oryza*, and seed storage equipment for national centres were presented to assist the germplasm workers of national centres. The inter-institutional collaboration between the United States Department of Agriculture and National Institute of Agricultural Sciences (Japan) on one hand and IRRI on the other was reassessed.

Attention was directed to the following areas which deserve greater efforts in the future: urgency in completing the assemblage of landraces, conservation of the wild species, systematic evaluation and characterization, seed storage (primarily medium-term), and documentation at national centres, manpower development, security of seedstocks under long-term storage, and free exchange.

The contribution of the IBPGR/IRRI Rice Advisory Committee in various fields of endeavour was recognized by the IBPGR chairman.

Participants from 3 major geographic areas (South Asia, Southeast Asia and Africa) drew up collection plans for the next 5 years and estimated the fund requirements. It is anticipated that the IBPGR will provide the bulk of the necessary funds, while IRRI will coordinate the field operations and supply the service of an adviser or field collector. Small-scale collection in Latin America and Oceania will be separately developed.

A discussion also took place on the scope and terms of reference of the Advisory Committee to the International Rice Germplasm Center at IRRI.

Publication of the proceedings of the Workshop was targeted for the XV International Congress of Genetics, held in December 1983 in New Delhi.

NEW BOOKLET

A new booklet entitled "Practical Constraints Affecting the Collection and Exchange of Samples of Wild Species and Primitive Cultivars" has been published by the IBPGR. This publication identifies the difficulties encountered on many levels of germplasm collection and maintenance. Regarding the timing of collection, particularly for wild species, the most common restraints are (1) lack of phenological information on the species to be collected and (2) the heterogeneity of seed maturing time.

The booklet recommends that emphasis be given to adequate pre-planning of collecting missions using information from as many sources as possible, viz: climatic and meteorological data, local information on sites and phenology, study of herbarium specimens, and reports of any previous exploration missions. Other pre-planning exercises recommended include obtaining necessary permits, arranging transport, and identifying appropriate channels for transfer of the seed and attendant regulations.

The booklet is the result of a consultation organized by the IBPGR in March 1983 at the Beltsville Agricultural Research Center, Maryland, USA.

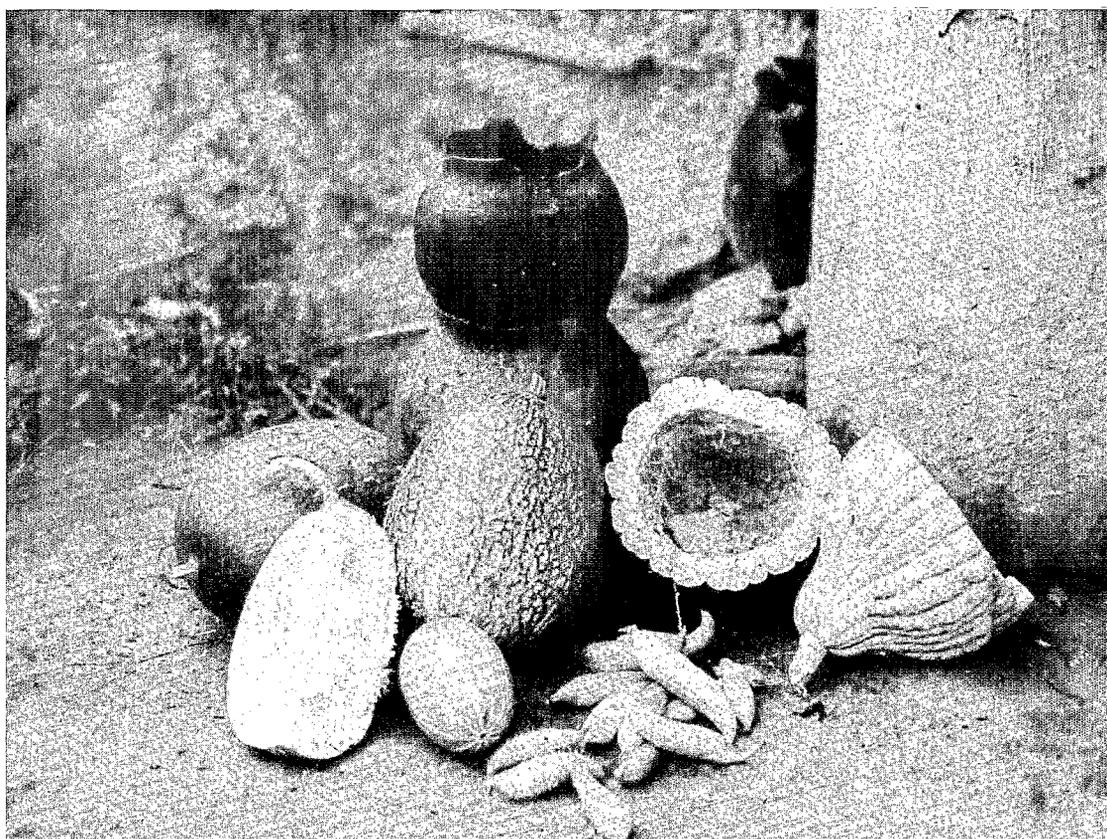
This booklet is recommended to all readers of this Newsletter.

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