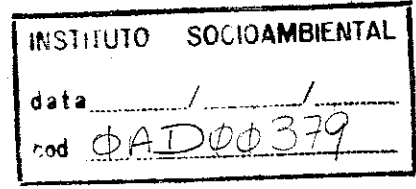


- Lozano, C. (1985). Comprehensive breeding approach to pest and disease problems of cassava. In Cock, J.H., and Reyes, J.A. (eds) *Cassava: Research, Production and Utilization*, pp. 569-574 (Cali: Centro Internacional de Agricultura Tropical)
- Metraux, A. (1948). The Tupinamba. In Steward, J.H. (ed) *Handbook of South American Indians*, pp. 95-133 (Washington, D.C.: United States Government Printing Office)
- Meuser, F. (1978). Cassava flours and starches: some considerations. In Weber, E.J., Cock, J.H. and Chouinard, A. (eds) *Workshop on Cassava Harvesting and Processing, Cali, Colombia 1978. Proceedings*, pp. 37-40. Monograph IDRC- 114e (Ottawa: International Development Research Centre)
- Meuser, F. and Smolnik, H.-D. (1980). Processing of cassava to gari and other foodstuffs. *Starch/Starke*, 32 (4) S., 116-122
- McKey, D.M. and Beckerman, S. (1993). Chemical ecology, plant evolution, and traditional manioc cultivation systems. In this volume, pp. 83-112
- Morán, E. F. (1973). Energy flow analysis and the study of *Manihot esculenta* Crantz. *Actas Amazônica*, 3 (3), 29-9
- Nordenskiöld, E. (1924). *The Ethnography of South America Seen from Mojos in Brazil* (Göteborg: Erlanders Boktryckeri Aktiebolag)
- Purseglove, J.W. (1968). *Tropical Crops: Dicotyledons I* (New York: John Wiley)
- Renvoize, B.S. (1972). The area of origin of *Manihot esculenta* as a crop plant: A review of the evidence. *Economic Botany*, 26, 352-360
- Rogers, D.G. (1965). Some botanical and ethnological considerations of *Manihot esculenta*. *Economic Botany*, 19, 369-377
- Sauer, C.O. (1950). Cultivated plants of Central and South America. In Steward, J.H. (ed) *Handbook of South American Indians*, Volume 6, pp. 507-533 (Washington, D.C.: United States Government Printing Office)
- Schwerin, C.H. (1971). The bitter and the sweet: some implications of the traditional techniques for preparing manioc. Paper presented at the annual meeting of the American Anthropological Association
- Sinha, S.K., and Nair, T.V.R. (1968). Studies on the variability of cyanogenic glucoside content in cassava tubers. *Indian Journal of Agricultural Science*, 38, 958-963
- Steward, J.H. (1948). Tribes of the montana and Bolivian East Andes. In Steward, J.H. (ed) *Handbook of South American Indians*, pp. 507-533 (Washington, D.C.: United States Government Printing Office)
- Steward, J.H., and Faron, L.C. (1959). *Native Peoples of South America* (New York: McGraw-Hill)
- Toro, J.C., and Canas, A. (1976). Determinacion del contenido de materia seca y almidon en yuca por el sistema de gravedad especifica. In Dominguez, C.E. (compiler) *Yuca: Investigacion, Produccion y Utilization*, pp. 567-575 (Cali: Centro Internacional de Agricultura Tropical)
- Wheatley, C., Lozano, C. and Gómez, G. (1985). Post harvest deterioration of cassava roots. In Cock, J.H., and Reyes, J.A. (eds) *Cassava: Research, Production and Utilization*, pp. 655-671 (Cali: Centro Internacional de Agricultura Tropical)



CHAPTER 49

THE STORAGE OF MANIOC PRODUCTS AND ITS SYMBOLIC IMPORTANCE AMONG THE TUKANOANS

Christine HUGH-JONES and Stephen HUGH-JONES

INTRODUCTION

It is well known that the storage of cooked manioc products, notably sun-dried cassava bread and griddle-dried *farinha* (dried granules of pulped manioc tuber), is commonly practised by many lowland South American Indians. However, it is sometimes assumed that other methods of storage are either made impossible by the limitations of technology and climate or are anyhow unnecessary because unharvested manioc tubers can be easily stored in the ground (see Mowat, 1989: 43-45). This chapter describes two techniques, one short-term and one long-term, which are widely used for the wet storage of processed manioc starch and manioc fibre by Tukanoan-speaking Indian groups (Tatuyo, Taiwano, Bará, Barasana and Makuna) living in the Pirá-Paraná region of the Colombian Comisaría del Vaupés in NW Amazonia (fieldwork was carried out in 1968-71, 1979, 1984, 1990 and 1991). Given the cultural similarities between these groups and the other Tukanoan and Arawakan-speaking Indians living in the Colombian and Brazilian northwest Amazon region, it is probably safe to assume that the same or similar techniques have, or once had, a much wider distribution.

Unlike other Amerindian groups who periodically make large batches of cassava which they dry in the sun and then eat from store, the Pirá-Paraná Tukanoans prefer their cassava freshly-cooked and their women are expected to make new batches daily. They also use an unusually elaborate method of processing manioc in which pulp from the grated tubers is washed with water through a sieve. The starch, carried down with the water, separates out in a bowl below whilst the fibrous portion remains in the sieve above.

Several different varieties of cassava are produced which differ mainly in the amounts of starch and fibre used to make them. Separating the two components and then recombining them on baking allows the women to control the relative proportions (C. Hugh-Jones, 1979: 135). The first stor-



Plate 49.1 Manioc starch in the bottom of a newly-prepared pit (upper) and Barasana women removing starch from an old starch pit (lower)

age technique, involving the keeping of relatively small quantities of starch and fibre for short periods, is an integral part of this process and makes this more elaborated cuisine possible.

The second technique (Plate 49.1), involving the lengthy storage of large quantities of pure manioc starch, is related to the nutritional and symbolic importance attached to this product by the Tukanoans. *Weta*, the word for "manioc starch", has the more general meanings of "powder", on the one hand, and "essence, concentrate" on the other. The starch itself is seen as the quintessence of whiteness and is used as a "paint" to pick out designs carved on sacred flutes made of black palm wood (S. Hugh-Jones, 1979: 85, 97-99). Starch boiled with water is used to make *oko kâbo* (*mingau* in *lingua geral*), a refreshing drink with a sticky, glutinous texture symbolically associated with semen. Cassava made entirely from pure starch is considered to be the most nutritious form and thin rounds of this cassava (*sireria*) are eaten as a luxurious treat: during the period of ritual seclusion that follow their initiation into manhood, young boys live on a diet of sauba ants (*Atta* spp.) eaten together with this special kind of cassava.

The end of this period of seclusion is marked by a big dance called "the house of cassava" (*dâhu kîîra wi*), to which large numbers of guests are invited. The centre-piece of this rite is a pile of cassava, a metre or more high and some 60 - 90 cm in diameter wrapped in white *Cecropia* leaves and decorated with macaw and oropendola tail feathers round which the dancers dance. The rounds of cassava, each some 2 cm thick, are made just prior to the dance from starch which has been stored up over the preceding months. At the end of the dance, the cassava is ceremonially distributed by the host community whilst the guests throw hundreds of small lumps of cassava, tied to the ends of short lengths of "bark string", up into the beams of the house "to make the house white" (S. Hugh-Jones, 1979: 134).

This dance is a celebration of the initiate boys' new status and of the productivity and fertility of women of the host community, and the large amount of cassava distributed adds to their prestige. It is only through the long-term storage of manioc starch that such large quantities of this ritually important cassava, used to feed gatherings of up to one hundred and fifty people, can be produced at one moment. In addition, the store also provides an emergency supply which can be used on journeys or as an insurance against crises such as crop-failure or illness.

THE FIBRE STORE

Each adult woman in a longhouse will have one or more stores of manioc fibre (*kîha sadiro*) which she draws on daily as she bakes cassava. The store is made from an old wood-splint carrying basket (roughly 50 cm

high by 40 cm in diameter) which is supported on the outside by vertical palm-wood battens stuck into the earth floor close to the area at the rear of the house where manioc is processed. The basket is lined inside with "wild banana" (*oho hũ* – *Heliconia* sp.) leaves, each one covering the bottom and extending up the sides; it is filled nearly to the top with fibre, the leaves are closed over and the whole is then topped with a thick layer of earth which comes up to the rim of the basket. If starch is stored at the same time, it is placed at the bottom and separated from the fibre by a layer of leaves. One such store contained about 40 kg of fibre and about 20 kg of starch. Unprocessed grated manioc pulp (*kibo*) may also be stored in the same way.

As each day's cassava is made, the ingredients from an earlier processing are taken from store whilst fresh stocks of starch (and fibre) are laid down from the tubers processed that day. Though they are normally used up in rapid rotation, if necessary the contents of such stores can be kept for a week or more before being attacked by small maggots.

THE STARCH PIT

In addition to these temporary stores, each woman of the house will also have between one and four starch pits (*weta gohe*) dug into the earth in the cleared sandy area at the rear of the longhouse. The pits are made roughly 60 to 120 cm deep and between 45 to 60 cm in diameter and lined with some 30 wild banana leaves which cover the bottom and stick up about 45 cm above the ground. The hole is filled nearly to the top with raw starch which has been taken daily from the bowl beneath the washing sieve and accumulated in the house. It is placed in the pit a layer at a time and pressed down firmly so that it forms a solid but still damp mass. This is covered with wild banana leaves and topped with a thinner (10–15 cm) layer of fibre which serves both as a protective covering and as a bait for maggots. The leaves at the sides are then bent over the top to form a neat parcel and the remaining hole is then filled with a layer of earth pressed down firmly to form a tight seal.

The starch is normally laid down about a year in advance of use but it will last up to two years or more; in times of hunger, people are said to dig on the sites of long-abandoned houses in search of forgotten but still-edible stores. In time, the leaf lining of the store begins to rot and the protective layer of fibre often becomes filled with maggots which may also penetrate a thin layer at the top and sides of the starch mass. To prevent spoiling, every three or four months the starch is dug up and the leaf lining and fibre capping are replaced. Any maggots present are carefully removed before the starch is re-packed in the newly-lined pit.

Uncooked, long-buried starch has a quite powerful, rank smell but the cassava made from it has a pleasant, if slightly sour, taste. This variety of cassava (*wetaro*) is either eaten fresh or allowed to dry out so that it can be stored again for a longer period in its own right. After storage, it is wetted with water and given a brief, supplementary cooking on the griddle.

Although it mainly used for manioc starch, this same method of storage in leaf-lined pits is also used to preserve other kinds of foodstuffs: grated *umarí* (*Poraqueiba sericea*) seeds used to bake glutinous dull-red cassava-like rounds; pulped *japurá* (*Erismia japura*) and *sũbio* (*Monpterix angustifolia*) seeds used to make cheesy pastes (see also Dufour and Zrucchi, 1979: 77); and the pulped fruits of *mirití* (*Mauritia flexuosa*), *pupunha* (*Guiljelma gasipaes*) and *pataua* (*Jessenia bataua*) palms which are used to prepare various drinks.

DISCUSSION

Beyond simply setting the record straight – despite claims to the contrary, some Amazonian Indians do indeed store manioc for both practical and symbolic reasons – this information has wider potential significance. Firstly, we might expect to find similar storage pits turning up as unexplained features in archaeological sites in Amazonia. Secondly, and related to this point, although it is now generally recognized that data from contemporary Amerindian groups are not always a reliable guide to pre-contact practices or conditions, this point is often forgotten. That manioc storage is rare today does not necessarily mean that it was uncommon in the past, a past when populations were larger and when their economic and ceremonial life was undisturbed.

Their markedly hierarchical social organization together with their unusually elaborate ritual and mythological traditions, their priest-like *kũbu* shamans and their own traditions of origin, all suggest that the eastern Tukanoans are either descended from, or influenced by, the groups that lived along the lower Río Negro and middle Amazon prior to European contact. These groups had much larger populations (Cooke and Piperno, 1993, this volume) and more complex forms of social organization than any that are found today (Posey, 1993, this volume). It is precisely amongst such peoples that one might expect to find storage techniques associated, as they are today, with a more elaborated cuisine, with the need to feed large groups of people and with a ritual complex which has significant economic consequences.

ACKNOWLEDGEMENTS

The fieldwork for this research was variously supported by grants from the Social Science Research Council, the Economic and Social Research Council, the British Museum and King's College, Cambridge.

REFERENCES

- Cooke, R. and Piperno, D. (1993). Native American adaptations to the tropical forests of Central and South America, before the European colonization. In *this volume*, pp. 25-36
- Dufour, D. and Zucchini, J. (1979). *Monopteryx angustifolia* and *Erisma japura*: their use by indigenous peoples in the Northwestern Amazon. *Botanical Museum Leaflets* (Cambridge, Massachusetts: Harvard University Press)
- Hugh-Jones, C. (1979). *From the Milk River* (Cambridge: Cambridge University Press)
- Hugh-Jones, S. (1979). *The Palm and the Pleiades* (Cambridge: Cambridge University Press).
- Mowat, L. (1989). *Cassava and Chicha: Bread and Beer of the Amazonian Indians* (Aylesbury: Shire Publications)
- Posey, D.A. (1993). The importance of semi-domesticated species in post-contact Amazonia: effects of Kayapó Indian dispersal on flora and fauna. In *this volume*, pp. 63-71