

Ethnopharmacologic perspectives on diet and medicine in Northern Nigeria

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RÉSUMÉ

Nous présentons une revue sur l'usage des plantes par les Hausa du Nigeria du Nord. Elle fournit les données spécifiques qui montrent comment l'usage multicontextuel des plantes élargit le champ des circonstances qui exposent les peuples aux constituants pharmacologiquement actifs. Les catégories particulières d'usage de plantes examinées ici sont : médecine, nourriture, cosmétique et hygiène personnelle. La recherche est orientée particulièrement sur une seule classe d'activité — action antimicrobienne — et sur les plantes qui entraînent le plus de chevauchement entre les catégories (« overlapping ») considérées. De plus, nous montrons comment le savoir-faire d'utilisation des plantes par les peuples indigènes aide à conserver la biodiversité.

INTRODUCTION

Since our pioneering work (ETKIN AND ROSS 1982) which emphasized the significance of overlapping contexts of use for medicinal and food plants, we have advocated a synthetic treatment that fully explores the pharmacologic implications of plant use by contemporary populations. This paper reviews the use of plants by Hausa people in northern Nigeria, to provide specific data that illustrate how the multicontextual use of plants extends the range of circumstances and media that expose people to pharmacologically active constituents. The issue is further problematized to illustrate how this multicontextual use helps to conserve biodiversity.¹

RESEARCH SETTING AND METHODS

Since 1975 we have sustained a comprehensive investigation of medicine, diet, and health in a rural Hausa community in northern Nigeria. The research site is a remote rural village located 50 km southeast of the urban center of Kano. The nucleated hamlet numbers approximately 400 residents, whose subsistence includes (still largely) nonmechanized agriculture supplemented by trade and livestock raising. The region is characterized by sparse savanna vegetation (shrubs and trees)

which was once interspersed by grasses and is now, after generations of intensive agriculture and grazing, highly disturbed. Over the last several decades local populations have been increasingly influenced by the introduction of biomedicine, nonlocal foodstuffs, and commercial products for cosmetics and manufacture. But despite pressures toward biotic simplification and the availability of nonlocal products, Hausa still have opportunity to select from among a large number of local plant species for medicinal, culinary, and other objectives.

Conceived initially as a study of Hausa plant medicines, the scope of our research was necessarily expanded to include systematic dietary and related surveys, as we acknowledged use of the same plants in these various contexts (for recent discussions of methods, consult ETKIN & ROSS 1991a; ETKIN *et al.* 1990; ROSS *et al.* 1991). In order to address the physiologic implications of plant use, we focused our attention further on plants actually ingested, inhaled, or applied in such a way that contact with the body occurs for sufficient time to convey physiologically active plant constituents to receptive tissues — as, for example, when the constituents of topically applied medicines are absorbed transdermally (percutaneously).

PLANT MEDICINES

For this Hausa population plant medicines still dominate preventive and therapeutic medicine. This sustains "tradition" — not in a static and passive sense, but as part of a dynamic medical paradigm that retains and transforms conventional elements at the same time that it absorbs such innovations as exotic botanicals and pharmaceutical drugs (ETKIN *et al.* 1990).

Of the 374 plants used in preventive and therapeutic medicine, 345 are used for disorders with overtly physiologic symptoms such as fever, stomach upset, or pain; for these, Hausa invoke naturalistic etiologies which include excess heat, or contamination with dirt. 266 plants figure in the mediation of spirits or malevolent human agency such as witchcraft and sorcery; disorders attributed to these causes typically are ignored in ethnopharmacologic studies because there is no biomedical analogue, and because they are dismissed by researchers as "simple superstition" without empirical basis. I deliberately include treatments and preventives for witchcraft and sorcery because they involve ingestion and other contact with plants that carries the potential of exposing people to physiologically active substances. These categories are summarized in Table 1.

Table 1
Hausa Plant Medicines

| Intended use | "Semi-wild" Plants | | All plants | |
|---------------------|--------------------|------------|------------------|-------------------|
| | n plants | n remedies | n plants | n remedies |
| Overtly physiologic | 254 | 1854 | 345 | 2275 |
| Other | 215 | 452 | 266 | 526 |
| Totals | 272 ^a | 2306 | 374 ^a | 2801 ^b |

a. Totals are less than the sums due to multiple plant uses.

b. Excluded are 5 remedies that specify plant location or situation rather than species.

MEDICINAL FOODS

Plant medicines overlap most conspicuously with foods (ETKIN & ROSS 1991b): of the 119 plants that this population identify as food, all but 5 are included among the total 374 medicinals. This does not mean that Hausa intermix the domains food and medicine. In fact, they do not: doing medicine and doing food are conceptually and physically discrete. But Hausa cultural and biological knowledge of plants affords considerable flexibility of use. The same plant, even the same plant part may have both medicinal and culinary functions, so that the category "medicinal foods" is a large one.

A further refinement of these data draws attention to "semi-wild" plants among the Hausa medicinal foods.² These are plants that are not expressly cultivated but are affected by

human agency nonetheless: plants that are not removed when they appear adventitiously on farms, or that might be encouraged (but not cultivated) in other locations in which they occur — in compounds, on farm borders, in public spaces (see discussion below on sources and biodiversity). Hausa use 254 semi-wild plants for physiologic disorders and 215 for diseases of other etiology (Table 1).

Noncultigens have been overlooked by researchers of human diet — perhaps not so much deliberately, but because the field methodologies applied in food surveys are insufficiently rigorous to identify items that have no counterpart in western cuisines (*e.g.*, something other than "starches," "vegetables," and the like) and do not appear in existing published compilations of "Foods of X Region." This reflects a tacit, shared perception that wild plants do not contribute substantially to routine food intake, whereas, in fact, wild foods are customary and meaningful features of cuisines worldwide: noncultigens are used variously as full meal elements, as snacks, or to stretch, flavor, garnish, or otherwise mark other foods. As it relates to health, some researchers propose that the value of wild foods lies in their amplification of diet by increasing the range of available nutrients generally. More specifically they identify certain nutrients that have an established link to immune competency — for example, vitamins, minerals. Discussion later in this paper reveals that while conventional nutrient quality deserves attention, there are other, pharmacologic implications of consuming these "wild" species.

In keeping with the central theme of this discussion, I emphasize again that the use of plants in more than one context — here food and medicine — has significant implications for the extent to which people are exposed to pharmacologically active constituents. It merits examining medicinal plants used for hygienic and cosmetic objectives as well.

PLANTS AS ITEMS OF PERSONAL HYGIENE

Recorded for use in personal hygiene are plants included in such activities as general bathing and attending to hair, teeth, and skin. To the extent that these are routine activities, performed several times per day, this context offers regular and substantial exposure to whatever active constituents occur in the substances used. Plants are concocted into soaps, oils, media for oral lavage, hair treatments, and chewing sticks. Of the 16 plants so identified, all are used as medicines, 6 also as foods, and 3 also as cosmetics (Table 2).

COSMETIC PLANTS

Cosmetic plants are used principally by women, whose objectives include the adornment of eyes (typically with black or blue colors), highlighting designs that have been cicatrized or drawn onto the skin, and pigmentation of skin and lips with red color agents. Girls learn cosmetics at an early age; boys and men imitate this adornment rarely, and irregularly.

Table 2
Hausa Plants Used for Personal Hygiene:
Overlapping Contexts of Use

| Genus species | Hausa | Med | Food | Cos | Hyg |
|--|--------------|-----|------|-----|-----|
| <i>Anogeissus leiocarpus</i> (DC) Guill & Perr | MARKE | ● | | | ● |
| <i>Arachis hypogaea</i> L. | MAN GYADA | ● | ● | ● | ● |
| <i>Azadirachta indica</i> A Juss | DARBEJYA | ● | | | ● |
| <i>Bærhavia diffusa</i> L. | GADON MACIII | ● | | | ● |
| <i>Bærhavia repens</i> L. | GADON MACIII | ● | | | ● |
| <i>Commiphora africana</i> (A Rich) Engl. | DASHI | ● | ● | ● | ● |
| <i>Euphorbia lateriflora</i> Schum & Thonn | BI DA SARTSE | ● | | | ● |
| <i>Euphorbia balsamifera</i> Aiton | AIYARA | ● | | | ● |
| <i>Glossenema nubicum</i> Decne | TATARIDA | ● | | | ● |
| <i>Glossenema boveanum</i> Decne | TATARIDA | ● | | | ● |
| <i>Indigofera arrecta</i> Hochst ex AR | BABA | ● | ● | ● | ● |
| <i>Khaya senegalensis</i> (Desr) A Juss | MADACI | ● | | | ● |
| <i>Salvadora persica</i> L. | SHIWAKA | ● | ● | | ● |
| <i>Vernonia colorata</i> Drake | SHIWAKA | ● | ● | | ● |
| <i>Vernonia amygdalina</i> Del | SHIWAKA | ● | ● | | ● |
| (Unidentified) | SABULIN SALO | ● | | | ● |

In addition, the oil of one plant (*Arachis hypogaea*) is widely used by men and women to confer a healthful (shiny) appearance. These plants are listed in Table 3: all 19 are used medicinally, 5 also appear in diet, and (as noted above) 3 are used in personal hygiene as well.

SOURCES OF SEMI-WILD PLANTS AND BIODIVERSITY

The broader literature on indigenous plant management bears testimony not only to the extensive knowledge of local ecology that is shared among indigenous peoples, but also to how their management of a mix of micro-habitats conserves biodiversity. There exists as much variety among the sources from which Hausa extract semi-wild plants as there is among the different ways in which the plants are used. Substantial botanical diversity is contained within the borders that separate the many small land parcels farmed by villagers; approximately 16% of Hausa semi-wild medicinals occur in these 2-3 meter-wide strips of land. Twenty-seven percent of the semi-wild medicinals occur on public lands — the borders of footpaths that connect the village hamlets to one other and to neighboring villages, and the larger expanses reserved for cattle grazing. All these areas maintain vegetative cover throughout the year, even during the dry season. They constitute an important source of diversity — as one would anticipate, given the nature of activities described for those areas.

Paradoxically, most — 46% — of Hausa semi-wild medicinals occur on farms, where they have been intentionally disregarded during weeding in order to reserve them for use in diet, medicine, and other anticipated or actual needs. This identifies the Hausa farm as something considerably more complicated than monocropped or intercropped stands of domesticated plants. It is instead the locus of significant botanical diversity that has been deliberately constructed and maintained. Through this management of farms, farm borders, public lands, and in-compound space, Hausa sustain biodiversity that is locally,

Table 3
Hausa Plants Used for Cosmetics:
Overlapping Contexts of Use

| Genus species | Hausa | Med | Food | Cos | Hyg |
|---|-----------------|-----|------|-----|-----|
| <i>Acacia nilotica</i> (L) Willd ex Del | GABARUWA | ● | | | ● |
| <i>Acacia nilotica</i> (L) Willd ex Del var. <i>tomentosa</i> (Benth) AF Hill | GABARUWA | ● | | | ● |
| <i>Anacardium occidentale</i> L. | KANJU | ● | ● | ● | |
| <i>Arachis hypogaea</i> L. | MAN GYADA | ● | ● | ● | ● |
| <i>Argemone mexicana</i> L. | KWARKO | ● | | | ● |
| <i>Bombax buonopozense</i> P Beauv | GURJIYA | ● | | | ● |
| <i>Cola nitida</i> (Vent) Schott & Endl | GORO | ● | | | ● |
| <i>Cola acuminata</i> (Pal) Schott & Endl | GORO | ● | | | ● |
| <i>Commiphora africana</i> (A Rich) Engl | DASHI | ● | ● | ● | ● |
| <i>Datura innoxia</i> Mill | ZAKAMI | ● | | | ● |
| <i>Diospyros mespiliformis</i> Hochst | KANYA | ● | ● | ● | |
| <i>Feretia canthioides</i> Hiern | KURUKURU | ● | | | ● |
| <i>Feretia apodanthera</i> Del | KURUKURU | ● | | | ● |
| <i>Indigofera arrecta</i> Hochst ex AR | BABA | ● | ● | ● | ● |
| <i>Lawsonia inermis</i> L. | LALLE | ● | | | ● |
| <i>Nicotiana tabacum</i> L. | TABA | ● | | | ● |
| <i>Portulaca oleracea</i> L. | DABURIN SANTIYA | ● | | | ● |
| <i>Thelepogon elegans</i> Roth | LADANBALI | ● | | | ● |
| <i>Trianthema portulacastrum</i> L. | DABURIN SANTIYA | ● | | | ● |

and even regionally, germane (Etkin 1994b). I return to this point in the conclusion.

PHARMACOLOGIC IMPLICATIONS OF MULTICONTEXTUAL PLANT USE

I have drawn attention here to only four overlapping contexts of plant use. This could be complicated significantly by considering additional uses that provide opportunity for exposure to active botanicals, via either ingestion or prolonged contact with skin and other tissues. Plants are, after all, also used in the fabrication of craft items, house construction, fishing, hunting, insect control, and veterinary practices. But that merely reinforces the point: the use of plants in many con-

texts results in significant exposure to whatever constituents are contained within those plants.

At this juncture, a more fruitful exercise is to redirect attention to the pharmacologic potential of these plants in order to assess the health implications of their use. This too is complex, especially as such activity is mediated by differences among plant parts, growing locations, season, and mode of preparation (including combination with other plants). Whereas a full pharmacologic assessment is beyond the scope of this paper, it is possible to further refine the inquiry by focusing on a single class of activity, antimicrobial action, and on plants that demonstrate the most overlap among the use categories considered – *i.e.*, plants to which people are exposed on a more regular and sustained basis by virtue of their multiple uses.

I direct attention now to the 8 plants used in 3 or more of the contexts addressed in this paper: medicine, diet, personal hygiene, and cosmetics (Table 4). Antimicrobial activity has been demonstrated for 7 of these, the exception being *Arachis hypogaea*, which Hausa regard as more a vehicle than a medicine proper. Of the 5 plants used as cosmetics, all but *A. hypogaea* are bactericidal, suggesting that it is worth exploring whether the cosmetic application of these plants to and around the eyelids may have preventive or therapeutic action against bacillary conjunctivitis. These plants also are active against staphylococci and streptococci that colonize the skin and which then constitute potential risk in cosmetic cicatrization. *Vernonia colorata*, *V. amygdalina*, *Commiphora africana*, and *Salvadora persica* are fabricated into chewing sticks which may be held in the mouth for long periods after active tooth brushing has ceased; they are also used therapeutically for gum disorders. Of these 4, *V. colorata* is active against lower gastrointestinal (GI) pathogens (helminths and amoebae), suggesting that its efficacy in maintaining oral health may be related to mechanical abrasion of cariogenic pathogens and to promotion of mucosal integrity via tissue stimulation. The other 3 plants demonstrate antimicrobial activity against pathogens of the oral cavity (streptococci, lactobacilli, and mixed saliva micro-organisms).³ My point is that, to the extent that any of these actions signifies in the prevention and treatment of disease, the fact that the plants are used in more than one context amplifies their pharmacologic potential — perhaps exponentially so.

This treatment of a subset of medicinal plants is not comprehensive, but it provides a model for structuring inquiry in such a way that one can link pharmacologic action to ethnomedical practice more meaningfully than do catalogues of pharmacologic detail that do not take into account local therapeutic objectives and overlapping contexts of use.

Table 4
Hausa Plants Used in at Least 3 Contexts

| Genus species | Hausa | Med | Food | Cos | Hyg |
|--|----------|-----|------|-----|-----|
| <i>Anacardium occidentale</i> L. | KANJU | ● | ● | ● | |
| <i>Arachis hypogaea</i> L. | MANGYADA | ● | ● | ● | ● |
| <i>Commiphora africana</i> (A Rich) Engl | DASHI | ● | ● | ● | ● |
| <i>Diospyros mespiliformis</i> Hochst | KANYA | ● | ● | ● | |
| <i>Indigofera arrecta</i> Hochst ex AR | BABA | ● | ● | ● | ● |
| <i>Salvadora persica</i> L. | SHIWAKA | ● | ● | | ● |
| <i>Vernonia colorata</i> Drake | SHIWAKA | ● | ● | | ● |
| <i>Vernonia amygdalina</i> Del | SHIWAKA | ● | ● | | |

CONCLUSION

Applying a multicontextual perspective to inquiry on medicinal plants reveals more about the physiologic significance of these plants than do the single-use studies that are constrained by traditional disciplinary boundaries that define as “primary” application the use of plants in diet (by nutritionists), in medicine (by medical personnel and ethnographers of medicine), etc. I have demonstrated here that attention to the overlapping contexts of plant use more realistically depicts people’s experience with plants and, further, underscores the significance of individual species to which people are regularly exposed. The research strategy employed here problematizes a group of plants to one activity category (antimicrobial action), allowing one to develop depth rather than only the breadth provided by lists of plants or their constituents. Similarly, one can focus on single symptoms or disease complexes — for example GI disorders (ETKIN & ROSS 1982), or malaria (ETKIN 1994a) — to explore the pharmacologic potential of plants used in multiple contexts. Analysis can be further refined by examining, for example, how plant use covaries with gender, age, and occupation — that is, how the implications of plant use shift as demographic characteristics affect the extent of exposure to pharmacologically active plants.

A final statement positions the present study at the center of global issues related to preserving biodiversity. The assertion that multicontextual use of plants by Hausa helps to conserve biodiversity can be extrapolated to other localities. At present, species marked for preservation are identified by politics external to the specific social and biological contexts in which those plants exist. Closer attention to the ethnographies in which those plants are embedded, including the various contexts in which they are used, will help to better identify “important” species in a manner consistent with the way in which indigenous populations utilize those plants.

NOTES

1. Some of the data that were presented to the European Colloquium on Ethnopharmacology and the International Conference on Ethnomedicine: "Medicines and Foods: The Ethnopharmacological Approach" (March 1993, Heidelberg) have since been published (ETKIN 1994a; ETKIN & ROSS 1994).

2. The wild-domesticated continuum that characterizes human-plant interactions is transected by intergrading categories so that, with the exception of major crop domesticates, it is difficult to position individual plants. Further, the way in which a plant is managed is not the same across time or place: people who extensively cultivate a plant in home gardens may at the same time exploit wild forest-dwelling individuals of that species; and cultivated plants may never undergo the genetic changes that "domestication" technically entails. In the intensively farmed and highly disturbed environment of this part of Hausaland, no plant has been unaffected by human action, thus none is truly "wild." Fully recognizing the blurred boundaries between the terms used to express relative degrees of domestication, still I use the term "semi-wild" as a heuristic device.

3. Information on plant activities represents the summation of a broad-based literature search, including data compiled by NAPRALERT.

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