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Ritual enemas and snuffs in the Americas

The objectives of ethnopharmacology are to rescue and document a vast cultural knowledge before it is lost to the world, and to investigate and evaluate the agents employed without any prejudice or bias in order to find the rationale for their use.

Jan G. Bruhn and Bo Holmstedt

To my parents
Aan mijn ouders

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PREFACE

From prehistoric times till the present day, mankind has employed biologically active agents for various purposes. The scientific evaluation of these practices requires a multi-disciplinary approach that comprises the observation, identification, description and experimental investigation of the ingredients and the activity of the agents used. This complex field of research between anthropology, archaeology, philology, botany, zoology, chemistry, pharmacology and medicine has now become known as ethnopharmacology. Its principal objective is not to advocate a return to aboriginal practices, but to document the use of traditional preparations and to validate or invalidate their alleged activity (Bruhn and Holmstedt 1981). It is obvious that the results of a critical scientific evaluation will permit an advantageous feed-back to traditional medicine. The efficacy of useful indigenous drugs may be improved, once their therapeutic principles have been identified, whereas harmful or ineffective herbal therapies may be discouraged. For instance, over the last fifteen years, overwhelming evidence has been obtained that many plants containing pyrrolizidine alkaloids should no longer be used because of their hepatotoxicity (Buurma and Vulto 1984). Ethnopharmacological research may also give impulses to modern western medicine. In contrast to common belief, investigations of tradionally used plant material still lead to the discovery of new substances that may deserve a place in our modern therapeutic arsenal. The evaluation of Chinese medicinal plants would seem to be particularly fruitful in this respect (Xiao 1981), with the antimalarial compound qinghaosu from Artemisia annua as a spectacular example (Jiang et al. 1982; Li et al. 1984). When a biologically active principle of a natural product cannot be applied as such, it still may be useful as a lead in drug design by providing a novel molecular structure with potentially interesting effects (Krogsgaard-Larsen et al. 1984).

Not only studies of aboriginal medicinal plants, but also investigations of ritually used psychoactive drugs are within the scope of ethnopharmacology. In various parts of the world, aboriginal peoples and tribes have taken intoxicating vegetal preparations as facilitating agents in religious trance induction, divination, witchcraft and healing ceremonies (Efron et al. 1967; Furst 1976a; Emboden 1979a; Schultes and Hofmann 1980a,b; Völger et al. 1981; Dobkin de Rios 1984). The recovery of Sophora secundiflora from well dated archaeological sites in northeastern Mexico and Trans-Pecos Texas suggests that such

ritual plant uses may date back to millenia before our era (Adovasio and Fry 1976).

It is obvious that only the ethnological discipline can highlight the attitude of the aboriginals themselves towards their sacred drugs. The essence of the catholic mass for the church-goer is certainly missed by saying that mass wine is prepared from Vitis vinifera L. (Vitaceae) and that it contains about 13 per cent of the inebriating substance ethyl alcohol before it is diluted by the priest. There is an essential difference, however, between the catholic priest and the native shaman. The former has no intention whatsoever of becoming drunk, whereas the latter tries to reach an intoxicated state that will enable him to enter supernatural realms. Nobody has put this into words more eloquently than the peyotist Quanah Parker: 'the white man goes into his church and talks about Jesus; the Indian goes into his tipi and talks to Jesus' (Grinspoon and Bakalar 1981). Due to this fundamental difference, it is not merely allowed, but even necessary, to supplement field observations of native drug rituals with the results of laboratory experiments on the alleged activity of the drugs employed.

Such investigations have perhaps nowhere arrived at more scintillating results than in the domain of hallucinogenic plants. Today, only a few western clinicians consider hallucinogens to have any therapeutic value. According to a chapter in an authoritative pharmacological text book, the use of LSD (lysergic acid diethylamide) has been abandoned, either because controlled studies have failed to demonstrate its therapeutic value, or because the elaborate precautions required to minimize adverse psychological reactions dampened enthusiasm and rendered its therapeutic use impractical (Jaffe 1980). Yet ethnopharmacological studies on ritual psychoactive drugs may have an impact on medical care in western society. Firstly, they may lead to an improved clinical management of careless western youngsters who arrive in emergency wards after self-experiments with herbal 'highs' derived from native practices (Hall et al. 1978; Stienstra et al. 1981; Young et al. 1982). Secondly, they may provide new pharmacological tools for neurochemical research. For instance, the Banisteriopsis alkaloid harmaline has turned out to be a valuable selective inhibitor of MAO-A enzymes (Fuller et al. 1981). Thirdly, they may result in the discovery of synthetic substances with potentially therapeutic properties. A recent example is the development of specific agonists of the central GABA-ergic system from the fly agaric constituent muscimol (Flach et al. 1984). Fourthly, might there never come another time when the present categorical condemnation of

hallucinogenic drug therapy will be reevaluated (Grieco and Bloom 1981)?

Aside from any direct or indirect medical significance, ritual native intoxication is a fascinating area of research in its own right. It constitutes an important culture trait of primitive man which, just as other parts of our cultural heritage, deserves to be carefully documented and evaluated. I became interested around 1978 when I was shown an enema scene on a polychrome Maya vase. Such scenes were thought to represent intoxicating enema rituals, and their existence had only just been brought to light by Furst and Coe (1977). Here I saw an opportunity to combine my artistic preference for pre-Hispanic American cultures with my pharmaceutical education in botany, chemistry and pharmacology. I started to collect additional data on enema rituals in the New World, and soon found out that a comprehensive approach to the subject had never been published. I therefore intensified my literature search, which first resulted in brief articles on South American Anadenanthera enemas (de Smet 1981a) and on ritual enema scenes on ancient Maya pottery (de Smet 1981b), and then in a general overview of the subject (de Smet 1983b).

During my search for ritual enemas, I kept looking for information on other non-oral ways of ritual intoxication among Indians. I thus learnt that intoxicants have always been more widely used as snuffs than as clysters, especially on the South American continent. In contrast to ritual enemas, snuffs had already been given a comprehensive outlook in the sixties (pp.231-373 in Efron et al. 1967). So many new data had come to light, however, since this survey had been published, that the compilation of an up to date overview appeared to be warranted (de Smet 1985a).

My reviews on ritual enemas and on ritual snuffs in the western hemisphere form the basis of this thesis. Adapted and extended versions are presented in chapter one and in chapter two, respectively. The relevant data published before October 1, 1984 are summarized and a few important references appearing after this date are also included. The remaining gaps are filled as much as possible with unpublished information from experts and with the results of some self-experiments. Nasal self-experiments became possible by the clinical facilities and plasma level determinations of Jan Jonkman and Wim van der Boon (caffeine) and those of Laurent Rivier and Pierre Baumann (harmine). Their analytical procedures are described in Appendix D and Appendix E.

Chapters one and two have been given a similar structure. In part one of each chapter, I review the ethnobotany, phyto-chemistry and basic psychopharmacology of the intoxicating dosage form. A psychoactive plant may only elicit a pharmacologically induced subjective response, however, if at least one active constituent (or active biotransformation product) reaches an appropriate central site of action in an adequate amount. This amount is governed not only by the dosage of the constituent, but also by its manner of administration and by its subsequent fate in the body, i.e. by the absorption, distribution, metabolism and excretion of the constituent. In other words, the pharmacological validation of the reputed central effects of a native ritual dosage form must take into account that its active constituents, besides having intrinsic pharmacological effects, are molecules with a characteristic pharmacokinetic profile. This concept, which I propose to call the ethnopharmacokinetic aspect of native ritual intoxication (vide chapter three), still has to be fully recognized by many non-pharmacological scholars. To set an example, data on the pharmacokinetics and efficacy of possible enema and snuff constituents via their native route of administration are reviewed separately in part two of chapter one c.q. in part two of chapter two.

Cooperation with other researchers has allowed me to present original chemical and archaeological data in chapter one and chapter two.

Part three of both chapters is devoted to the gas chromato-graphical/mass spectrometric investigation of some Indian enema and snuff materials, located by me in European collections. The analyses were generously performed by Laurent Rivier, who outlines his procedures in Appendix A. Part three of chapter one describes the chemistry of 19th century paricá seeds, which reportedly were used as an enema and snuff ingredient by the Brazilian Maué Indians (de Smet and Rivier 1985b). Part three of chapter two reports the composition of two contemporary yopo snuffs of the Venezuelan Piaroa Indians (de Smet and Rivier 1985a).

Part four of chapter one discusses enema scenes on pottery of the classic Maya civilisation (300-900 A.D.). I could not have written this part without the help of Nicholas M. Hellmuth, who unselfishly guided me through the complex iconography of Maya enema scenes. This Maya specialist already reviewed the principal diagnostic accessories of Maya enema scenes in an unpublished paper in 1978. To give him credit, a revised version of this paper is included here as Appendix B. Hellmuth has based his

review primarily on photographical material from the large archive of his Foundation for Latin American Anthropological Research. By courtesy of the Foundation, this material is largely presented here (vide Appendix C). The publication of so many photographs is essential, since the ritual enema paraphernalia on classic Maya pottery can only be fully highlighted by showing vase painting after vase painting. Part four of chapter one firstly presents an iconographical and linguistic view, and then provides a multidisciplinary outlook on reputed Maya intoxicants (de Smet and Hellmuth 1985).

During the preparation of my reviews on enemas and snuffs, I discovered various scientific flaws in the consulted literature. When Richard Schultes invited me to contribute a chapter to a new book on ethnobotany, I therefore decided to review some botanical, chemical and pharmacological pitfalls in the multidisciplinary approach to native ritual intoxication (de Smet 1985c). This more general paper on certain methodological aspects underlies the third and final chapter of this thesis.

One of the most striking mistakes in some sources on ritual drugs is the inappropriate handling of pharmacological data. Actually, this does not come as a great surprise, because authors in this field often lack a pharmacological background. As a consequence, the concluding chapter is particularly meant to provide a non-pharmacological audience with an easily readable outline of a few important pharmacological principles. An inevitable drawback of this objective is, of course, that readers trained in pharmacology will find few, if any, startling points of view in the concluding chapter.

Some of the ideas in chapter three are not derived from my quest for Indian enemas and snuffs, but from the preliminary results of other research projects, viz. the taking of intoxicating drugs by New Guinea natives (de Smet 1983a), and the ritual use of fumigatories in Middle and South America (de Smet 1985b). The former communication stems from my eagerness to learn more about ritual drug practices in former Dutch colonies, the latter is a logical consequence of my continuing interest in non-oral intoxication among American Indians.

I felt that the inclusion of these papers in the thesis would not only enforce certain points in chapter three, but would also contribute to the general usefulness of the thesis as an ethnobotanical and ethnopharmacological work of reference. Since the preliminary character precluded the presentation as full-fledged chapters, I decided to add them as appendices, viz.

appendix F on New Guinea practices and appendix G on Latin American fumigatories. Appendix F may seem to compromise the coherency of the thesis by focusing on another part of the world, but this is only true in the geographical sense. From the methodological point of view, the ethnobotanical uniformity of the thesis remains unaffected.

The scope of the data presented in the thesis is determined by its particular purpose, i.e. the multidisciplinary search for scientific evidence of the alleged psychoactivity of Indian ritual preparations.

Ethnobotanical data

American Indians have used the enema and the snuff not only as a ritual intoxicant, but also as a medicinal cure (Densmore 1928; Nordenskiöld 1930; Hallowell 1935; Heizer 1944; Cobo 1964; Vogel 1970). The former type is included as much as possible so that sometimes even vague and unsubstantial data are discussed. In contrast, the latter type may only be mentioned when the reported ingredient is a plant with proven or reputed psychoactive properties.

Details are mostly restricted to certain secular aspects, such as the native group, the vegetal ingredient, the vernacular name, the botanical identity, the method of preparation, the specific use and the claimed activity. No systematic attempt is made to place the various practices into their cultural context, as this would go beyond the bounds of the subject. For instance, the iconographical and linguistic approach to enema rituals on ancient Maya pottery is limited to the enema paraphernalia portrayed in these scenes, and pays little attention to other aspects, such as the identification of the participants and their occurrence in other Maya rituals.

Since botanical information is crucial for any experimental approach, the availability of at least some tentative botanical identification has been applied as a decisive factor for the inclusion of field data. As a result, the snuff review bypasses the topasayri snuff of the early Peruvians (Cobo 1964), the saakona snuff of the Sanema Indians (Wilbert 1963), the kokoime snuff of the Karimé tribe (Salathé 1931), the baduhu-tsiña snuff of the Denís (Prance 1972) and the ayukuma snuff of the Mahekodotedi (Zerries and Schuster 1974).

In many cases, ethnological references designate plants with incomplete, misspelled or obsolete scientific names, and the indication of a herbarium voucher specimen is far from common. To avoid false impressions of botanical accuracy, the authors of Latin binomials have been excluded throughout the text. Complete

scientific names of the species and varieties mentioned in the ethnobotanical sections are found at the beginning of each section.

Chemical data

Chemical information is given about the qualitative and quantitative composition of the vegetal sources and, where possible, on the ultimate dosage forms themselves. With respect to the phytochemistry of the source-plants, data are mostly restricted to the parts used as an ingredient by Indians.

The consulted literature often indicates lengthy chemical names of plant constituents with an abbreviation. The abbreviations used in the thesis are listed at the end of this preface.

Pharmacological data

The pharmacological approach to intoxicating enemas and snuffs is specifically directed to the question of whether they may effectively produce a state of central intoxication. As this question may well be answered without in-depth attention to biochemical mechanisms, current ideas on the neurophysiology of hallucinogens (Jacobs 1984) and other ritual plant constituents have been left out of the discussion. Instead, the thesis focuses on the most eloquent evidence of psychoactivity, i.e. on the demonstration of central symptoms in human studies. Peripheral actions in man are not listed consistently and a glance at behavioural activity in laboratory animals is mostly reserved for those cases where no or few human data are available.

An hallucinogen is often defined as a non-addictive substance which consistently produces changes in perception, thought and mood, occurring alone or in concert, without causing serious disabilities like major disturbances of the autonomic nervous system; high doses may elicit disorientation, memory disturbances, hyperexcitation, stupour or narcosis, but these reactions are not characteristic. This definition is widely accepted, but some authors apply it more rigorously than others (Hoffer and Osmond 1967; Brimblecombe and Pinder 1975; Díaz 1979; Schultes and Hofmann 1980b; Grinspoon and Bakalar 1981), so that two types of hallucinogenic agents emerge from the literature:

- hallucinogens in a very strict sense, which are always classified as hallucinogens (e.g. indolalkylamines like psilocybin and phenethylamines like mescaline);
- hallucinogens in a broader sense, which are not always, but sometimes classified as hallucinogens (e.g. tropane derivatives like scopolamine and dibenzpyran derivatives like Δ^9-tetra-hydrocannabinol).

In the thesis, the term hallucinogen is used in its broader sense.

Index

The index does not contain broad terms like names of countries or plant families. It is restricted to the native plants and drugs, indigenous tribes and peoples, botanical genera and species, and chemical substances mentioned in the preface, chapters one, two and three, and appendices F and G.

The Hague, 1985

ABBREVIATIONS OF CHEMICAL COMPOUNDS

BBT	= 5-(3-buten-1-ynyl)-2,2′-bithienyl
DMT	= N,N-dimethyltryptamine
H	= harmine
5-HT	= 5-hydroxytryptamine
LSD	= lysergic acid diethylamide
5-MeO-DMT	= 5-methoxy-N,N-dimethyltryptamine
5-MeO-MMT	= 5-methoxy-N-monomethyltryptamine
6-MeO-MTHC	= 6-methoxy-2-methyl-1,2,3,4-tetrahydro-beta-carboline
6-MeO-DMTHC	= 6-methoxy-1,2-dimethyl-1,2,3,4-tetrahydro-beta-carboline
MMT	= N-monomethyltryptamine
MTHC	= 2-methyl-1,2,3,4-tetrahydro-beta-carboline
5-OH-DMT	= 5-hydroxy-N,N-dimethyltryptamine
T	= tryptamine
THC	= Δ^9-tetrahydrocannabinol
THH	= tetrahydroharmine