

Intoxicating Paricá Seeds of the Brazilian Maué Indians¹

PETER A. G. M. DE SMET² AND LAURENT RIVIER³

Paricá seeds were reportedly used as a snuff and enema ingredient by the Brazilian Maué Indians. We analyzed, by gas chromatography/mass spectrometry, paricá seeds from the first half of the 19th century. Despite their considerable age, the seeds yielded as much as 15 mg/g of the Anadenanthera alkaloid bufotenin, as identified by retention time on a capillary column and the mass spectrum. This analytical finding supports the view that the seeds originated from an Anadenanthera species.

In 1817 the Austrian Emperor Franz I gave his daughter Leopoldine in marriage to Dom Pedro, later to be the Brazilian Emperor Dom Pedro I. When the Archduchess Leopoldine made the crossing to the New World, she was accompanied by an Austrian expedition, which included the zoologist Johann Natterer (1787–1843). At the request of King Max Joseph von Bayern, the German explorers Johann Baptist von Spix and Carl Friedrich Philipp von Martius also joined this party. Most of the expedition members returned to Europe in 1821 because the Brazilian civil war broke out, but Natterer stayed behind and continued his travels in Brazil until 1835. During this time, he collected not only numerous biological objects, but also almost 2,000 ethnological items, which are now in the Museum for Ethnology, Vienna (Kann 1981). Since various Indian tribes from those days have become extinct or have lost their cultural identity, the importance of these early Brazilian ethnographical objects is obvious. There are only two other collections of this kind: the one from Spix and Martius (Zerries 1980) and an unpublished one from a Russian expedition led by the Earl Langsdorff (Kann 1981).

In contrast to Spix and Martius (1823–1831), Natterer never published his travel diaries, and unfortunately they were destroyed by fire a few years after his death, when the roof of the Viennese court library burned. Still remaining, however, are his correspondence to Europe and the museum inventory of his collection, written under his supervision. Both sources provide valuable information (Kann 1981, pers. comm.).

The Natterer collection includes various items of ethnopharmacological interest. Among these are 12 curare samples of the Mayoruma, Juri, Baniva, Jabaháni, and Mainatari Indians. The chemical composition of these arrow poisons was studied by Bauer (1965). There is also a large sample of well-preserved paricá seeds collected from the Maué tribe. So far as known, chemical data on these seeds have not yet been reported in literature. The museum inventory list (Fig. 1) provides the following details (translation ours).

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² Royal Dutch Society for the Advancement of Pharmacy, Alexanderstraat 11, 2514 JL The Hague, The Netherlands.

³ Institute of Legal Medicine, Rue Dr. César-Roux 29–31, CH-1005, Lausanne, Switzerland.

1339 Samenkörner des Paricábaumes (in
 1369 Matogrosso Angico genannt). Diese Kör.
 ner werden zerstoßen (zerrieben) und
 mit der Asche des Imbä¹⁴ uva baumes ge.
 mischt und dann zum Snuffen und zu
 bewirkenden Abführen gebraucht wird.
 Wird namentlich bei den Maucós, Muras, Cari.
 puras und anderen Nationen gebraucht.

Fig. 1. Number 1369 of the museum inventory on the Natterer collection in the Museum for Ethnology, Vienna.

Seeds of the paricá tree (called angico in Matogrosso). These seeds are crushed (ground) and mixed with the ashes of the imbauva tree and then used for snuffing and as intoxicating enemas. They are especially used among the Maué, Mura, Caripuna and other tribes.

Besides the seeds, Natterer collected ritual drug-taking paraphernalia of the Maué, Caripuna, and Marauá Indians (Fig. 2, 3). Detailed descriptions of these paraphernalia are given by Kann (1971) and Wassén (1965, 1972).



Fig. 2. Drug-taking paraphernalia of the Natterer collection, Museum for Ethnology, Vienna: pestle (a), snuff tray (b), and bag (c) of the Maué Indians; mortar (d) and snuff tube (e) of the Caripuna Indians; snuff container (f) of the Marauá Indians.

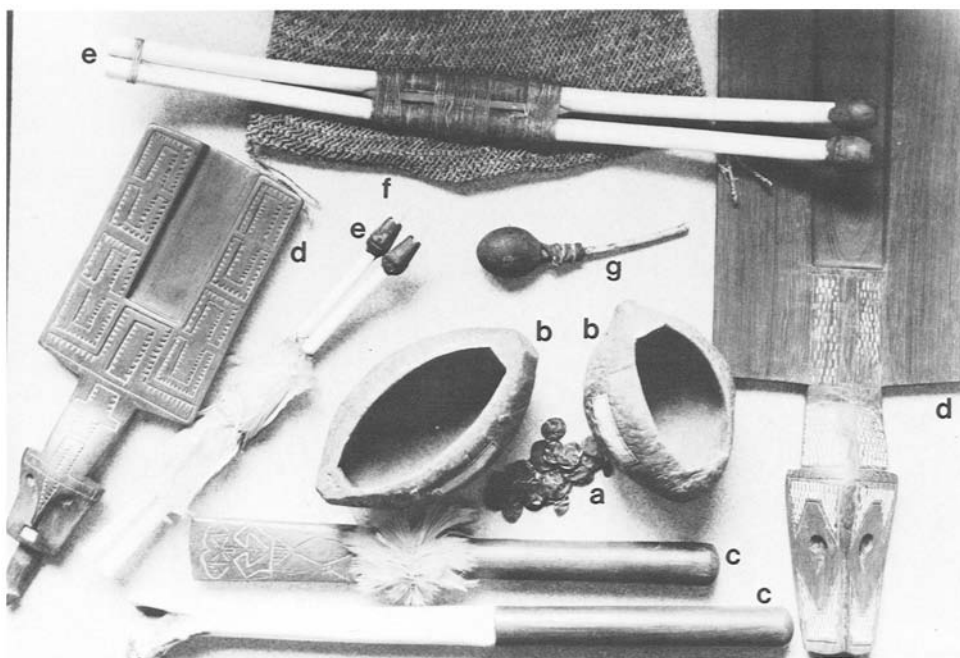


Fig. 3. Drug-taking paraphernalia of the Natterer collection, Museum for Ethnology, Vienna: paricá seeds (a), mortars (b), pestles (c), snuff trays (d), double snuff tubes (e), and bag (f) of the Maué Indians; enema syringe (g) of the Caripuna Indians.

The tracing of the seed sample is important because it has often been implied that the Maué and Mura Indians of the Brazilian Madeira River prepared paricá snuffs and enemas from *Anadenanthera* seeds. Up to now, however, these assertions have not been supported by an early collection of the seeds (Schultes 1967; von Reis Altschul 1972). Furthermore, the seeds are unique in the sense that no other ethnobotanical material from the western hemisphere has ever been directly associated with ritual rectal intoxication.

The seeds, black-brown, have a flat and orbicular shape and a diameter of 1–2 cm. These features are certainly reminiscent of *Anadenanthera* seeds (von Reis Altschul 1964), a view shared by von Reis (pers. comm.). Since there are no clear differences between seeds of the two *Anadenanthera* species, *A. peregrina* and *A. colubrina* (von Reis Altschul 1964), the species cannot be determined without additional plant parts.

Schultes et al. (1977) isolated 0.6% of bufotenin from seeds of *A. peregrina* that Richard Spruce had collected in 1854 from the Guahibo Indians of the upper Orinoco River. We hoped that the even older Maué seeds would also give a positive result, corroborating their identification as *Anadenanthera*.

ANALYTICAL METHODS

Isolation of alkaloids

Ground dry seed material (200 mg) was extracted with ethanol and a small amount of sodium hydrogen carbonate overnight at room temperature. After filtration and evaporation to dryness under

nitrogen, the residue was dissolved in a suitable amount of ethanol and submitted to gas chromatographic/mass spectrometric procedures comparable to those described by Schultes et al. (1977).

Gas chromatography/mass spectrometry (GC-MS)

Analyses were carried out on a combined GC-MS instrument (Model 5985A, Hewlett-Packard, Palo Alto). Typical GC conditions used throughout were: SE-54 WCOT fused silica capillary column (25 m $\times$ 0.3 mm i.d.), temperature of the oven isothermal at 100°C for 1 min and programmed at 10°C/min to 260°C. Split mode injections of 1.5 μ l were used at a helium carrier gas-flow of 1.2–1.5 ml/min through the column and a split ratio of 50:1. The capillary column was connected directly to the MS source, which was kept at 250°C. The ion source parameters were set by the Autotune program providing a 70 eV ionization energy and a 300 μ A emission current. Repetitive scanning from m/z 40 to m/z 340 was performed at one scan per sec. The tryptamines that may occur in *Anadenanthera* seeds were used as reference compounds. Mass spectrometric data for these substances are given by Schultes et al. (1977). Retention times and mass spectra of authentic reference compounds served as criteria for identification of the unknown compounds.

Quantitative analyses were performed by using the same analytical conditions. Solutions of known concentrations of reference compounds were injected after each extract sample. Calculation was made by external standardization of the detector response for each detected compound.

To check the occurrence of minor alkaloids, a more sensitive setting of the GC-MS was used. By using the selective ion monitoring mode (SIM) the detection could be increased 20 to 50 fold. Appropriate MS peaks of each compound to be detected were chosen and extracts injected. If the selected peaks emerged at the expected retention time for the reference compound, it was concluded that the substance was present in the extract.

RESULTS AND DISCUSSION

Despite their considerable age, the seeds yielded as much as 15 mg of bufotenin (=5-hydroxy-N,N-dimethyltryptamine) per g dry seed matter, as identified by retention time on the capillary column and the mass spectrum. This compound is a well-known *Anadenanthera* alkaloid that, despite an apparent lack of penetration into the brain, is reported to produce hallucinogen-like effects (de Smet 1983). Its occurrence in the Natterer seeds certainly supports the view that these seeds originated from an *Anadenanthera* species.

Other tryptamine alkaloids could not be detected. This is not surprising, since Schultes et al. (1977) reported that storage of freshly collected *Anadenanthera* seeds for 2 years resulted in disappearance of all tryptamines except bufotenin. It can therefore not be excluded that the Maué seeds originally may have contained more than one alkaloid.

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Book Review

Le Caoutchouc Naturel: Biologie, Culture et Production. P. Campagnon. Editions G.-P., Maisonneuve & Larose, 15 rue Victor Cousin, 75005 Paris. 1986. 595 pp. No price given.

With the many new uses being devised for natural rubber, the future of *Hevea brasiliensis* is assured. Many national, international, and commercial entities devoted to rubber production are engaged in extensive programs of improvement of this tropical crop plant from numerous viewpoints. In connection with these efforts, there is appearing an abundance of technical papers, but many of them are published in journals of limited circulation and consequently are not widely available.

Compagnon's volume on natural rubber brings the literature up-to-date and readily available, despite its being published in French. The product of 16 specialists and with a long introduction by Dr. R. de Paderac, president of the International Rubber Research and Development Board, this book will have a lasting influence on future orientation of scientific and commercial aspects of rubber production. It is divided into 27 chapters arranged in six parts: 1) *Hevea* and its medium; 2) Preparation and establishment of a plantation; 3) Exploration; 4) Cultural practices (including fertilization and diseases); 5) Collection and quality; and 6) World rubber production (including by-products and alternative sources of natural rubber. Attention is given also to alternative sources of rubber: guayule, kok-saghyz, cryptostegia, asclepias, goldenrod, etc. The bibliography of 1076 items indicates the inclusive scope of the book.

Le Caoutchouc Naturel deserves the widest possible distribution amongst those specialists working in rubber and tropical agriculture in general.

RICHARD EVANS SCHULTES, HARVARD UNIVERSITY, CAMBRIDGE, MA 02138