

Plantae Colombianae. XVI. Plants as Oral Contraceptives in the Northwest Amazon

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In the course of twelve years of field work in the northwestern part of the Amazon basin, I heard repeated references to the use by Indians of plants as oral contraceptives. Most of these reports were indirect or were in the nature of hearsay, and their reliability was, consequently, suspect. Some, however, were direct reports based upon personal knowledge and seemed to me to be worthy of serious investigation.

The use of a substance in a primitive society in the belief that it will control or prevent conception is not easy to investigate in the field. Wherever the Indian has come into close contact with civilization, he acquires a self-consciousness and reticence about free discussion of such a topic as contraceptive agents. He may very well employ them, but he refuses to talk about them. This is especially true within the sphere of influence of missionaries who usually crusade against the use of contraceptives.

That plants are widely employed in the Amazon in the belief that they prevent conception even the casual traveller will soon discover. The botanist who spends long periods in any region in close association with the natives of the area, hearing constantly about this use of plants but unable even to begin research on their identification, often feels a deep sense of frustration.

My itinerary, fortunately, took me on several occasions for long periods to rivers where the influence of civilized man is either weak and nebulous or does not exist at all. In such isolated areas, I learned of three plants employed as oral contraceptives and was able to collect botanical material for their determination. For two of these plants, I have a number of independent reports over a period of several years from members of different tribes. The third plant was pointed out independently by two Indians whom I had always found to be reliable sources of information, but both of them belong to the same tribe.

It is obviously impossible to prove or disprove in the field the efficacy of an agent which is taken to prevent conception, but repeated independent reports from sundry sources and which coincide in their details would appear to me reliably to indicate that the plant really is so employed. That all three of these plants belong, curiously enough, to the same family—the Araceae—might be interpreted as strengthening the reliability of these reports. It has been suggested that the use of aroids as oral contraceptives could be the result of phallic symbolism in reference to the spadix of the plant; and this may be true. Yet might we not risk the loss of perhaps a significant discovery were we to set ourselves up as judges and dismiss these uses as pure superstition?

The three plants in question belong to three different genera of the Araceae: *Anthurium*, *Philodendron* and *Urospatha*.

A spot test for the presence of alkaloids (Raffauf in Econ. Botan. 16 (1962) 171) proved to be negative in all three of the plants under discussion.

ANTHURIUM TESSMANNII K. Krause in Notizbl. 9 (1925) 260.

Plate I¹

Epiphytic plant with rather long, climbing caudex about 2 cm in diameter with congested, fibrous roots. Leaves chartaceous, conspicuously reniform or paddle-shaped, apically acute, basally long and gradually attenuate, nerves conspicuous on both surfaces but strongly elevated below, secondary nerves arcuate, at a 50-

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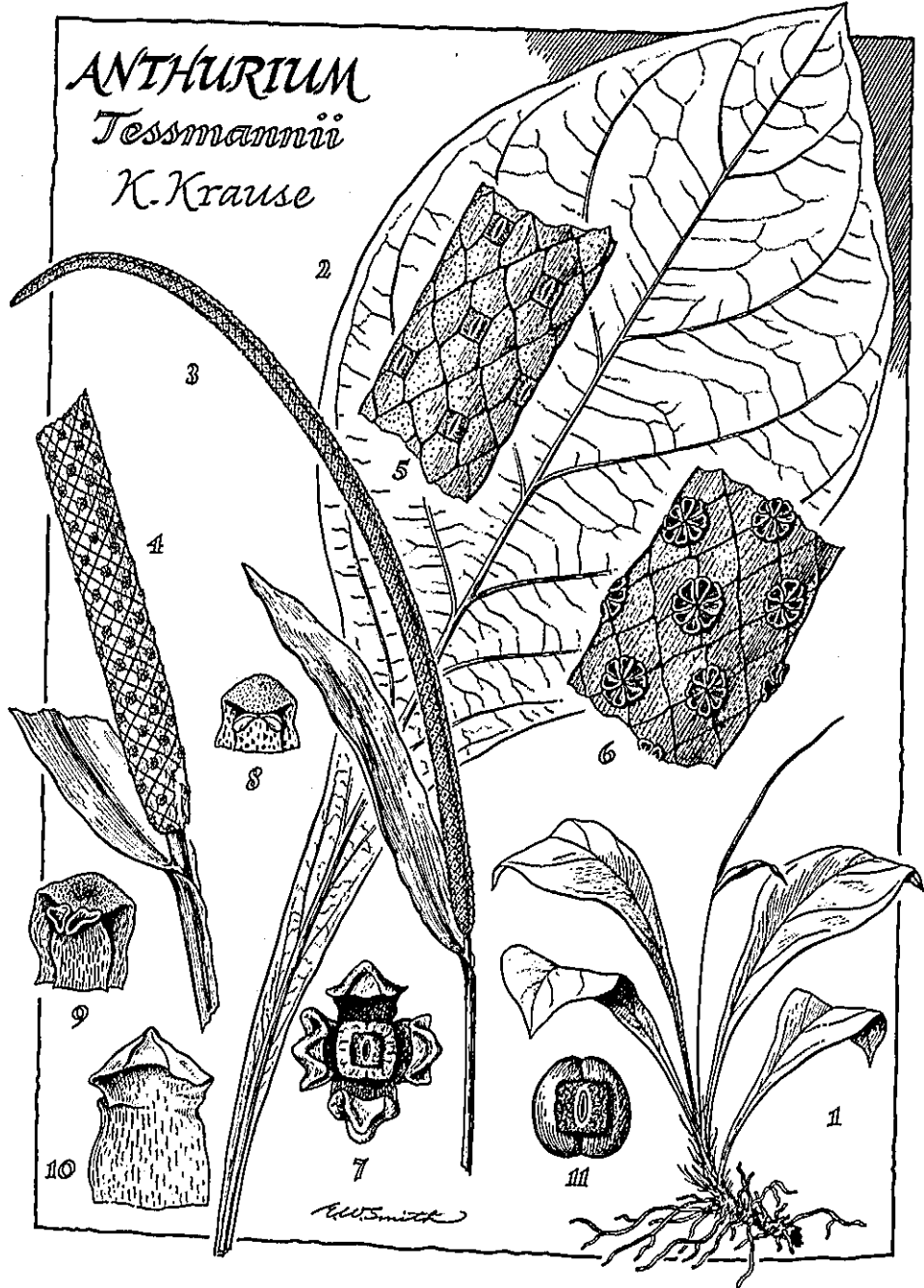


PLATE I

Anthurium Tessmannii K. Krause
 FIG. 1. Habit, \times about $\frac{1}{4}$. FIG. 2. Leaf, \times approx $\frac{3}{8}$. FIG. 3. Inflorescence, $\times \frac{3}{4}$. FIG. 4. Base of inflorescence, showing stipitate condition, $\times 2$. FIG. 5. Portion of young spadix, showing slit-like stigmas, $\times 6$. FIG. 6. Portion of mature spadix, showing opened anthers, $\times 6$. FIG. 7. Single mature flower (after dehiscence of stamens), $\times 6$. FIG. 8. Young tepal and stamen from fig. 6, \times approx $12\frac{1}{2}$. FIG. 9. Tepal and stamen from fig. 6, \times approx $12\frac{1}{2}$. FIG. 10. Mature tepal, $\times 8$. FIG. 11. Developing ovary with style and stigma, $\times 18$. Drawn by Elmer W. Smith.

60° angle to mid-vein, 7-10, strongly petiolate (petiole much shorter than blade, up to 8 cm long), up to 50-60 cm long and about 25 cm wide. Peduncle slender, terete, up to 35 cm long, dark green. Spathe green without, green mottled with purple within, linear, up to 10 cm long, 10-15 mm wide, marginally sometimes subcrispate. Spadix pale red, brownish or purple, stipitate (stipe up to 15 mm long), narrowly cylindrical, apically subacute, up to 28 cm long, 1 cm in diameter. Tepals ligulate, apically carnose-swollen, obtuse, growing in length and width with maturity: in very young state about 0.8 mm long, mature 3 mm long, 2 mm wide, carnose apical portion extremely plicate. Anthers yellow, about 0.3 mm long. Ovary quadrate-subglobose, 0.7 mm×0.9 mm surmounted by sessile, square to rectangular style (with an elliptic stigmatic surface) 0.45 mm long, 0.4 mm wide.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, between Ríos Pacoa and Kananarí, Soratama. Alt about 250 m "Epiphyte. 'Spike' purple. Fruits violet. Spathe greenish." June 21, 1951, R. E. Schultes et I. Cabrera 12772.—Same locality. "Epiphyte. 'Spike' grey-brown. Spathe green outside, green mottled with purple inside. Oral contraceptive-inflorescence." August 20, 1951, R. E. Schultes et I. Cabrera 13621.—Same locality. "Epiphyte. 'Spike' red-brown. Spathe greenish." August 16, 1951, R. E. Schultes et I. Cabrera 13535.—Same locality. "Epiphyte. Spathe brownish-green inside and out. Spadix brown." August 31, 1951, R. E. Schultes et I. Cabrera 13796. Comisaría del Vaupés Río Piraparaná, middle course. "Epiphyte." September 1, 1952, R. E. Schultes et I. Cabrera 17128.

Anthurium Tessmannii was described and has hitherto been recorded only from eastern Peru where it grows in rain forest at about 225 m altitude. Krause indicated that it was similar to *Anthurium Uleanum* Engler, also from Amazonian Peru.

In the Apaporis basin, *Anthurium Tessmannii* is not a rare plant. It is especially abundant in the middle course of the Apaporis and its affluent, the Piraparaná, where the Makuna Indians employ it in the belief that it has the property of preventing conception. The dried, ripened spike is pulverized and added to food taken by the women. Several Indians, belonging to the Makuna, Barasana and Taiwano tribes, all living in the middle Apaporois basin, pointed *Anthurium Tessmannii* out independently as a contraceptive agent, and all agreed in the method of its employment. The Makunas call the plant *ma-te-ke-pa*.

Philodendron dyscarpium R. E. Schultes sp. n.

Plate II, III

Suffrutex robustus, usque ad sex (saepius quattuor) ped. altus in saxis arenosis crescens. Caudiculus erectus, subarborescens, basi plus minusve 6 cm in diametro, dense foliati, internodiis elongatis inferioribus usque ad 25 cm longis, superioribus brevibus. Foliorum petiolus crassus, atroviridis, semiteres, usque ad 60 cm longus, supra late canaliculatus, basi conspicue vaginatus et cataphyllis praeditus. Lamina crassiuscula, coriacea, atroviridia, oblongo-ovata vel saepe ovata, apice breviter acuminata, basi rotundata, usque ad 40 cm longa, 25 cm lata, nervo centrale prominenter crasso, stramineo-viride, 1 cm in diametro, nervis lateralibus densissimis, omnibus aequalibus, a costo angulo acuto adscendentibus percursa. Pedunculi crassiores, apicem versus leviter incrassati, atrovirides sed sanguineo-maculati, plerumque 10-15 cm long, 1 cm in diametro. Spatha extus viridis subflavo-viridis et sanguineo-vel purpureo-maculata, intus intense sanguinea, expansa triangularis, apice acuta, aliquid convoluta, medio leviter constricta, basi inflato usque ad 15 cm longa, basi ad 6 cm lata, tubo 3-3.5 cm diametens, basi inflato bulbodeque cum spathae auricula obturato, apice usualiter longe acuminato.

Spadix rectus, cylindricus, crassus, apice redondatus, spathae aequilongus vel paullo brevior, inflorescentia feminea rufo-brunnea, 5 cm longa, 2 cm in diametro, inflorescentiae maculae pars sterilis brevis, paulum incrassata, fertilis flava vel subalba, elongata, anguste claviformis, usque ad 11.5 cm longa, 2 cm in diametro, summo apice obtusiuscula: pistillum late columnare, apicem versus aliquid constrictum, angulatum, plus minusve 3.5 mm longum, basi 2-2.3 mm diametriens, stigmatе rotundato piloso coronatum, 5- vel 6-loculare, loculis multiovulatis; flores masculi 2- vel 4-andri, stamina plus minusve 4.5 mm longa, apice 3 mm lata, anthera circiter 2.7 mm longa; staminodium columnare, truncatum, angulatum, 2.3 cm longum, in circuitu irregulariter rhomboideum, 1.8-3 cm diametriens.



PLATE II

Habit photograph of Philodendron dyscarpium R. E. Schultes from the type locality. Photograph by R. E. Schultes.

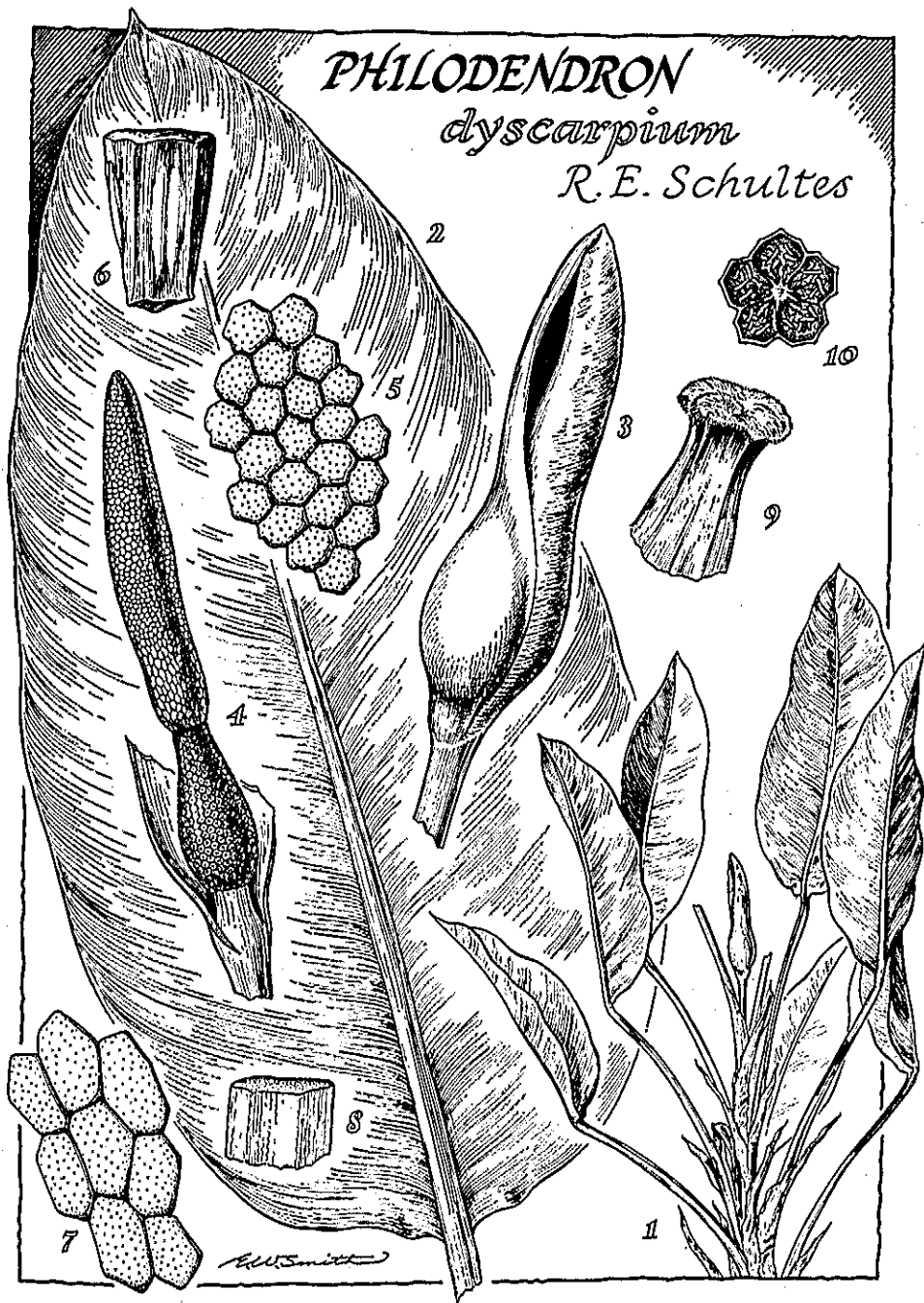


PLATE III

Philodendron dyscarpium R. E. Schultes

FIG. 1. Habit, $\times \frac{1}{8}$. FIG. 2. Leaf, $\times \frac{1}{2}$. FIG. 3. Inflorescence, $\times \frac{1}{2}$. FIG. 4. Inflorescence with part of spathe removed, $\times \frac{1}{2}$. FIG. 5. Portion of surface of distal part of spadix, showing stamens from above, \times approx 4. FIG. 6. Stamen, lateral view, \times approx $7\frac{1}{2}$. FIG. 7. Portion of surface of central part of spadix, showing staminodes from above, \times approx 4. FIG. 8. Staminode, lateral view, \times approx 4. FIG. 9. Pistil, lateral view, \times approx 10. FIG. 10. Pistil, cross section, \times approx 10. Drawn by Elmer W. Smith.

COLOMBIA: Comisaría del Vaupés, Río Kuduyarí, Yapobodá. Quartzite savannah near headwaters. Alt about 275-300 m. Lat 1°20'N, long 70°30'W. April 1953, *Richard Evans Schultes et Isidoro Cabrera 20059*. (TYPE in Econ. Herb. Oakes Ames; DUPLICATE TYPE in Herb. Nac. Colomb.)—Same locality. August 15, 1960, *R. E. Schultes 22615*.—Same locality. June 25, 1958. *H. García-Barriga, R. E. Schultes et H. Blohm 15839*. Río Kubiyú. Quartzite savannah of Guranjudá. Alt about 350-400 m. June 10, 1958, *H. García-Barriga, R. E. Schultes et H. Blohm 16034*.

This most interesting new species of *Philodendron* appears to belong to section *Baurisia* in subgenus *Euphilodendron*. It is distinguished from other species by its large size and its xerophytic, saxicolous habit. A number of floral characteristics, such as the peculiar columnar staminodes and stamens and the unusual pilose stigma, further separate the species from others in the section.

Philodendron dyscarpium grows abundantly in dense clumps on the metamorphic quartzite of the xerophytic savannahs north of the Río Vaupés in eastern Colombia. It has been collected only on the connected savannahs known as Yapobodá (near the headwaters of the Río Kuduyarí) and Guranjudá (along the Río Kubiyú), but I know from air reconnaissance that it covers vast areas of other similar and adjacent savannahs.

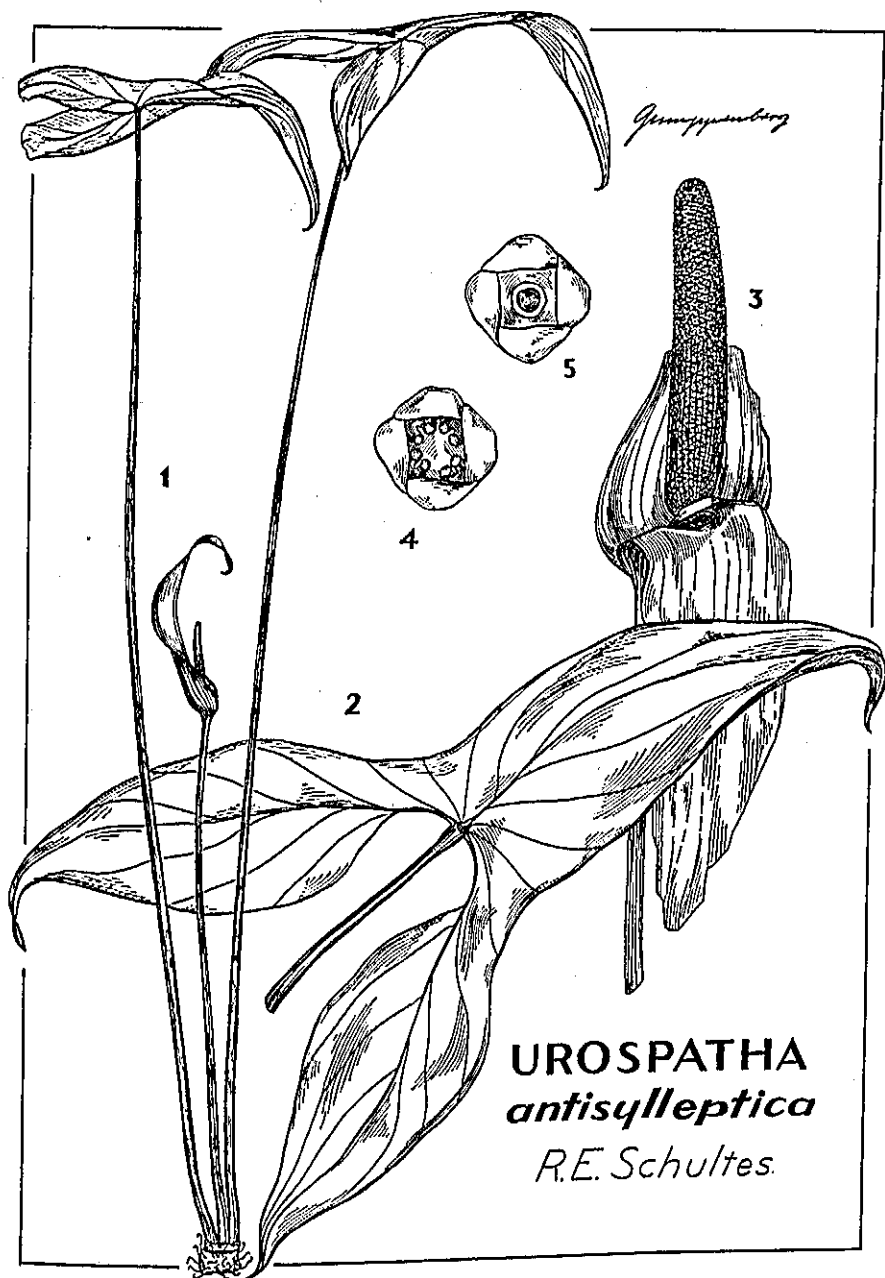
Philodendron dyscarpium, so named in reference to its contraceptive use, is apparently the most important of the plants employed in the Vaupés in the belief that it can reduce fertility. It was independently indicated by natives of the Kubeo and Tukano tribes who live along the Río Vaupés and its affluents, the Kuduyarí and Kubiyú, and who make occasional trips to the savannahs along these affluents for supplies of the drug. I have nine independent reports from four natives belonging to these two tribes. The inflorescence of *Philodendron dyscarpium* is dried and pulverized and the powder added to the food of the women as a deterrent to conception.

Examination of oven-dried (at 60°C) inflorescences by an American pharmaceutical house failed to disclose the presence of any constituent which might have contraceptive action, but the possibility that some volatile compound might have been lost in the drying or in the several months between collection and examination should be considered.

The Kubeo name for *Philodendron dyscarpium* is *he-pe-koo-la-ta*; the meaning of this name could not be discerned.

UROSPATHA ANTISYLLEPTICA *R. E. Schultes* in Bot. Mus. Leaflet. Harvard Univ. 18 (1959) 311. Plate IV

Herb up to 2 m tall, inhabiting swampy forests. Petiole of leaf succulent, comparatively slender, glabrous, lightly striated, dark green variegated with ashy green and dark purple spots, up to 150 cm long; blade hastate, up to 80 cm long when mature; upper lobe lanceolate, up to 47 cm long, basally 13 cm wide, at the base (near apex of petiole) with a very conspicuous, deep blood-red callus; lower lobe widely lanceolate, as long as upper lobe, up to 14 cm broad at widest part. Peduncle glabrous, more slender than petiole but similarly variegated, up to more or less 115 cm long. Spathe much shorter than leaves, open, spirally contorted, elongate-lanceolate, very long acuminate, greenish purple without, pale green but basally pink within, up to more or less 33 cm long, often splitting in maturity. Spadix sessile (not stipitate), perfectly cylindrical, apically rounded, reddish brown, short-adnate to basal part of spathe, about 5.5 cm long, 1 cm in diameter, half fertile. Flowers with 4 tepals, green. Ovary obovoid, locules 4-ovulate. Fruits and seeds not known.



UROSPATHA
antisylleptica
R.E. Schultes

PLATE IV

Urospatha antisylleptica R. E. Schultes
FIG. 1. Habit, \times approx $\frac{1}{4}$. FIG. 2. Mature leaf, \times approx $\frac{1}{6}$. FIG. 3. Inflorescence with spathe partially removed to show sessile spadix, \times approx $\frac{3}{4}$. FIGS. 4, 5. Aspects of flower and ovary, \times approx 10. Drawn by John Gumpfenberg.

COLOMBIA: Comisaría del Vaupés, Río Piraparaná (Tributary of Río Apaporis), headwaters of Caño Tee-mee-ña. September 10, 1952, R. E. Schultes et Isidoro Cabrera 17425.

The genus *Urospatha* has fourteen species. All are tropical American in range, occurring from Guatemala to southern Brazil. Speciation appears to be strongest in the Amazon Valley, with eight of the fourteen species (including the most variable with its several varieties: *Urospatha sagittifolia* (Rodsch.) Schott native to that region. All of the species are adapted to the wettest of swamps, and some may grow for months as aquatic plants during the season of highest floods.

Urospatha antisylleptica differs from *U. decipiens* primarily in being much larger and in having the sinus between the median and lateral lobes of the leaf at least twice as long. From *Urospatha Hostmanii*, the new species may be distinguished by its larger size, by its verruculose (not glabrous) petioles and by its having the base of the spathe only very shortly adnate to the spadix.

The bright blood-red or scarlet callus at the base of the leaf blade or apex of the petiole in *Urospatha antisylleptica* may be a distinguishing feature from all other species, for I have seen no reference to such a colour in the literature nor have I noticed it in several other species of this genus which I have had occasion to study and collect in the field.

Urospatha antisylleptica was pointed out independently by two Barasana Indians, who inhabit the upper course of the Río Piraparaná and its affluents, as the source of an oral contraceptive which is in common use in the tribe. They report that the unripened spadix is dried and pulverized and that, in order to prevent conception, the resulting brown powder is taken by women in their food. My stay in the Río Piraparaná was not long enough to permit me to check these statements thoroughly or to see the plant used. The specific name *antisylleptica* (from the Greek meaning "against pregnancy") calls attention to this unusual use of the plant.

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