

## CHROMOSOME NUMBERS IN PAEPALANTHUS (ERIOCAULACEAE)

Bruce D. Parfitt

Department of Botany & Microbiology, Arizona State University  
Tempe, AZ 85287

and

Nancy Hensold

Division of Biological Sciences, University of Michigan  
Ann Arbor, MI 48109

This chromosome investigation was initiated to help elucidate taxonomic problems in the preparation of a monograph of Paepalanthus subgenus Xeractis (sensu Koernicke 1863) by the junior author. Paepalanthus is a genus of over 490 species of South and Central America and the West Indies (Moldenke 1980). Subgenus Xeractis comprises 35 species of showy cauline or rosulate perennial herbs, characterized by large radiating involucre bracts which surpass the capitate inflorescence and by the presence of trichomes within the corolla tube of the male flowers. Despite the size and broad distribution of the genus, prior to the present study no chromosome numbers had been reported.

Materials and Methods. Flower heads with developmental series of buds were collected from plants growing in their native habitats. Heads were fixed in 70% ethanol and glacial acetic acid (3:1, v/v), transferred to 70% ethanol within a few days and refrigerated. Anthers were stained in Snow's stain or acetocarmine to which the dust of ferric ammonium citrate was added in minute quantities immediately prior to staining. Stained anthers were macerated and mounted in Hoyer's medium. Vouchers are deposited in MICH.

Results and discussion. Chromosome number determinations (Table I) were made for eleven individuals of seven species and one hybrid of Paepalanthus. Six species and the hybrid are diploid ( $\underline{n} = 25$ ); one species is tetraploid ( $\underline{n} = 50$ ). Although additional counts are needed to firmly establish a base number,  $\underline{x} = 25$  is suggested by these counts.

Except for the presence of two quadrivalents in the tetraploid P. mollis, no meiotic aberrations were detected. Bivalents were present in all diploid species investigated. In occasional specimens the chromosomes were sticky and uncountable or nearly so. This resulted in approximate determinations for two collections, one of P. argenteus (Hensold 297) and one of P. nigrescens (Hensold 366). Three additional counts for P. argenteus verified  $2\underline{n} = 25_{II}$  as the number for that species

These counts represent the first reported for Paepalanthus or the large subfamily Paepalanthoideae Ruhland. Subgenus Xeractis is entirely endemic to the Serra do Espinhaco in Minas Gerais, Brazil. However,



most of the species have very restricted ranges so that most species pairs are not effectively sympatric. The taxonomy of the group is difficult, being confused by reticulate variation patterns, apparently relictual intermediate forms linking well-differentiated species, and the frequent occurrence of hybridization with either P. argenteus or P. nigrescens usually involved in the parentage.

The parents of the hybrid here studied, P. superbus x argenteus, are quite distinct from each other, the former being a thin-stemmed cauline species with dark brown bracts occurring in shallow soils, the latter a rosulate species of deep soils with a woody underground stem and cream-colored bracts. The lack of meiotic irregularities in the hybrid suggests that cytological differentiation in this group may be much delayed with respect to morphological differentiation.

The Pico Itambe population, from which the tetraploid count of P. mollis was obtained is geographically isolated from other known populations of the same species. It also differs from them morphologically in several respects such as larger, firmer involucral bracts, thicker leaves, and larger flowers with very broad petals, all of which may be linked to the higher ploidy level. Unfortunately, chromosome counts could not be obtained for these other populations. Similarly contrasting pairs of forms also occur in other species of the subgenus. Further cytological investigation is desirable to determine where shifts in ploidy level may be partly responsible for these differences.

Table I. Documentation for chromosome numbers in Paepalanthus.

- Paepalanthus argenteus (Bong.)Koern.  $2n = 25_{II}$ . BRAZIL: Minas Gerais, Biri Biri Valley, 12 km W of Diamantina, 1100 m, Hensold 276; westernmost ridge of the Serra do Cipo, near Fechados, 1100-1250 m, Hensold 594; Serra do Cipo, SW of Conganhas do Norte, 1150-1400 m, Hensold 757.  $2n = ca. 25_{II}$ . BRAZIL: Minas Gerais, road to Conselheiro Mata, 29 km W of the Diamantina - Datas road, Hensold 297.
- Paepalanthus chysolepis Silveira.  $2n = 25_{II}$ . BRAZIL: Minas Gerais, road to Conselheiro Mata, 23 km W of the Diamantina - Gouveia road, 1250 m, Hensold 307.
- Paepalanthus complanatus Silveira.  $2n = 25_{II}$ . BRAZIL: Minas Gerais, Serra da Pedra Redonda, ca. 17 km NE of Jose de Melo, 1100-1200 m, Hensold 418.
- Paepalanthus mollis (Bong.)Koern.  $2n = 46_{II} + 2_{IV}$ . BRAZIL: Minas Gerais, summit of Pico Itambe, N of Serro, 2000 m, Hensold 613.
- Paepalanthus nigrescens Silveira.  $2n = ca. 25_{II}$ . BRAZIL: Minas Gerais, ca. 19 km E of Hotel Chapéu de Sol on the road to Conceicao do Mato Dentro, 1350 m, Hensold 366.
- Paepalanthus superbus Ruhland.  $2n = 25_{II}$ . BRAZIL: Minas Gerais, Serra do Cipo, SW of Conganhas do Norte, 1150-1400 m, Hensold 751.



Table I, continued.

Paepalanthus superbus X argenteus.  $2n = 25$ <sub>II</sub>. BRAZIL: Minas Gerais, Serra do Cipo, SW of Congonhas do Norte, 1150-1400 m, Hensold 754.

Paepalanthus uncinatus Gardn.  $2n = 25$ <sub>II</sub>. BRAZIL: Minas Gerais, 4--5 km W of Itambe do Mato Dentro on the road to Serra Cabeca de Boi, Hensold 425.

## Literature Cited

- Koernicke, F. 1863. Eriocaulaceae, in Martius, K. P. von, A.G. Eichler, and I. Urban, eds., Flora Brasiliensis. III. 1:273-507.
- Moldenke, H. N. 1980. A Sixth Summary of the Verbenaceae, Avicenniaceae, Stilbaceae, Chloanthaceae, Symphoremaceae, Nyctanthaceae, and Eriocaulaceae of the World as to Valid Taxa, Geographic Distribution, and Synonymy. Phytologia Memoirs 2:1-629.



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