



## Delimiting species boundaries within the *Bothriochloa saccharoides* complex (Poaceae) through morphometric analysis

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### Abstract

The *Bothriochloa saccharoides* complex is one of the most interesting groups within the genus *Bothriochloa* (Poaceae). The plants inhabit grasslands of tropical and subtropical regions from the Americas. Principal components analysis (PCA) and discriminant analysis (DA) were employed to evaluate the morphological variation among 60 herbarium specimens tentatively identified as *B. imperatoides*, *B. laguroides*, *B. longipaniculata*, *B. saccharoides* and *B. torreyana*. Twenty-three morphological characters were included in the analysis in order to clarify problematic species boundaries. Chemical data was incorporated to improve the resolution on delimitation of the species complex. Taxa were delimited according to the observed clustering of specimens in the PCA plots and discriminant analysis, and diagnostic characters were identified. The results showed that five taxa could be distinguished on the basis of morphological characters and chemical data. Two new subspecies are described: *B. saccharoides* subsp. *americana* and *B. saccharoides* subsp. *australis*. An identification key and a taxonomic synopsis are provided.

**Key words:** American grasses, Gramineae, geographical distribution, multivariate analysis, new subspecies, numerical taxonomy, species complex, species delimitation

### Introduction

*Bothriochloa* Kuntze (1891: 762) (Poaceae: Andropogoneae) occurs mostly in tropical and subtropical regions of Africa, America, Asia and Australia, and comprises 35 to 40 species (Clayton & Renvoize 1986, Nicora & Rúgolo de Agrasar 1987, Watson & Dallwitz 1992). In America, 12 native taxa show a disjunct distribution in North and South America (De Wet 1968, Allred 1981, Allred & Gould 1983, Vega 2000), and are important components of grasslands and savannas in those areas. According to their morphological and cytological characteristics, the American species belong to two complexes. In the *Bothriochloa barbinodis* (Lagasca 1816: 3) Herter (1940: 135) complex, the spikelets have a glandular pit in the first glume, spikelets are longer than 5 mm with a long awn, and the chromosome complement is  $2n=180$  or 220. The species of the *B. saccharoides* (Swartz 1788: 26) Rydberg (1931: 81) complex have the lower glume lacking a glandular pit, spikelets usually less than 5 mm, short awns, and a chromosome complement of  $2n=60$  or 120. Nevertheless, polymorphic species of difficult circumscription exist in both complexes (De Wet 1968, Allred & Gould 1983).

*Bothriochloa saccharoides* s.l. is an American perennial grass mainly distributed in two disjunct regions: a) southern United States, Mexico and West Indies, b) southern Brazil, Uruguay, Paraguay and Argentina. It has never been the subject of an adequate comparative study. There is high morphological diversity of specimens and still much uncertainty about the circumscription of especially the entities around *B. saccharoides*. For example, there are doubts if plants from the North and South America, assigned to *B.*