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# The annotated bibliography (1966-2006) of the genus *Tulbaghia* (Alliaceae)

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**Abstract** — An updated bibliography of the genus *Tulbaghia* (Alliaceae) is presented together with a synopsis and a revised and updated analytical key of the genus.

**Key words:** analytical key, bibliography, synopsis, *Tulbaghia*.

## INTRODUCTION

The genus *Tulbaghia* (Alliaceae) includes perhaps up to thirty species of rhizomatous plants endemic of Africa south of the Equator. The majority of the species is found in South Africa and twenty-two have been described so far.

The basic chromosome number of the genus is x=6 and all the species have been found to be diploid (2n=2x=12), but a few have polyploid forms albeit quite limited in distribution. The genus, confined as it is to the Southern Hemisphere, may be regarded as taxonomically vicarious of the widespread genus *Allium*, proper of the Northern Hemisphere.

The following account includes some notes related to the present status of its genus and the 1966-2006 bibliography, to be considerd as a celebration of the fortieth year of interest in the genus by the author. It includes also, as Appendix I and II respectively, an updated synopsis as well as a revised analytical key.

## RESULTS AND DISCUSSION

In quite recent times, most species of *Tulbaghia* have assumed a great importance in indigenous folk medicine in Southern Africa. The result is that they are often over-collected so much that many species are in danger of extinction and the genus itself is in urgent need of protection.

Altough only a limited number of the species of *Tulbaghia* can be said to be truly ornamental, the genus itself is regarded as very interesting from the horticultural point of view and well worth of collection on an amatorial basis. This may be quite important for the ultimate conservation of the genus through eventual *in situ* re-introduction.

A perusal of the bibliography and of the subjects of the articles in their chronological sequence, shows the steady progress in the knowledge of the genus *Tulbaghia*. This progress has been achieved first through the study of the chromosomes, which is the approach followed by the present author. The chromosome complement in its morphology, especially regarding the number and position of the nucleolar organizers, has been found to be species specific. This has allowed the genus to be grouped into discrete assemblages of species which, in turn have been found to be mostly related taxonomically.

The results of interspecific crossing, analysed by the careful study of meiotic pairing in the F1, has demonstrated the chromosome segmental relationship between species. This is a very important achievement and has lead to discover, the probable main trend of speciation at the chromosome level.

Further progress has been achieved through the study of the various species in the field and under cultivation. Besides increasing the knowledge of the genus as a whole, this has allowed the discovery and description of several new species.

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## APPENDIX I

1. Corona lobes 3, free to base ..... 20. ***violacea*** Harv.
20a. ***violacea*** Harv. var. ***maritima*** Vosa
21. ***cominsii*** Vosa

1a. Corona lobes 6 free or united at base:

2. Corona lobes free less than 1\4 as long as the perianth segments:

3. Perianth and corona purplish-mauve, rarely white; corona not fleshy, lobes very short, free; perianth segments oblong lanceolate ..... 19. ***rhodesica*** Fries

3a. Perianth greenish, lobes very long, very narrowly deltate; corona yellow or brownish, fleshy, very shallowly lobed ..... 6. ***tenuior*** Krause & Dinter

2a. Corona at least 1\3 as long as perianth segments, usually more than 1\2 as long:

4. Corona lobes free almost to base:

5. Leaves flattened or keeled, more than 3 mm wide; umbel (4) 7-8 (15) flowered; perianth glaucous green to light brown; corona fleshy, brown: ..... 1. ***capensis*** L.

5a. Leaves filiform, 1 mm wide; umbel (1) 2 (4) flowered; perianth pale green, corona pale green, not fleshy ..... 12. ***galpini*** Schl.

4a. Corona lobes united at least half their length:

6. Corona lobed to 1\3, lobes acute:

7. Leaves often more than 1 cm wide; perianth pink or mauve, rarely white; corona of the same colour ..... 11. ***simmleri*** G. Beauverd

7a. Leaves up to 7 mm wide; flowers greenish-white; corona brownish-green or yellow-orange:

8. Leaves shiny above, mat beneath, with a prominent midrib underside, perianth segments often with inrolled margins, usually reflexed, inner and outer whorls more or less of the same length ..... ..... 17. ***montana*** Vosa

8a. Leaves mat and glaucous on both surfaces, without a prominent midrib; perianth segments white, pinkish or pink, more or less flat or spathulate, usually not reflexed, inner whorl shorter than outer ..... 14. ***natalensis*** Bak.

6a. Corona lobed to less than 1\3, lobes rounded and fleshy:

9. Corona much wider than long:

10. Leaves more than 18 mm wide; inner and outer perianth segments inserted more or less at the same level:

11. Leaves keeled beneath, style much shorter than ovary ..... 8. ***macrocarpa*** Vosa

11a. Leaves not keeled beneath, style more or less as long as the ovary ..... 5. ***dregeana*** Kunth.

9a. Corona at least as long as broad:

12. Corona with very indistinct lobes:

13. Corona half as long as flower, leaves up to 4-5 mm wide, somewhat V-shaped in section; perianth segments usually very reflexed ..... 10. ***acutiloba*** Harv.

13a. Corona less than 1\3 as long as the flower, leaves more than 5 mm wide, keeled, inner perianth segments fused to the corona for most of its length, more or less reflexed ..... ..... 22. ***pretoriensis*** Vosa & Condy

14. Leaves 6-10 mm wide, more or less flat and only sligthly keeled; perianth segments short, not very markedly reflexed ..... 9. ***transvaalensis*** Vosa

14a. Leaves 15 to 25mm wide, more or less distichous ..... 4. ***ludwigiana*** Harv.

12a. Corona with distinct lobes:

15. Corona much shorter than the spathulate perianth lobes; leaves filiform ..... ..... 16. ***coddii*** Vosa & Burbidge

15a. Corona more or less equalling the usually acute perianth segments; leaves filiform only in some forms of ***leucantha***.

16. Longest pedicels more than 5 cm long; inner segments fused to the corona for most of its length ..... 7. ***nutans*** Vosa

16a. Longest pedicels less that 2,5 cm long; inner perianth segments fused to the corona for less than half its length:

17. Inner and outer perianth segments arising from the base of the corona ..... ..... 2. ***alliacea*** L.f.

17a. Inner perianth segments fused to the corona for up to half its length:

18. Perianth segments less than 1\3 as long as broad:

19. Perianth segments flat, apex acute ..... 3. ***cernua*** Avé-Lall. 4. ***ludwigiana*** Harv.

19a. Perianth segments with incurved margins, apex obtuse or spathulate ..... 15. ***verdoorniae*** Vosa & Burbidge

18a. Perianth segments at least 4 times long as broad:

20. Perianth tube much longer than corona, leaves 9-10 mm wide ..... 18. ***cameroni*** Bak.

20a. Perianth tube shorter than corona, leaves 1-6 mm wide ..... ..... 13. ***leucantha*** Bak.

## APPENDIX II

Synopsis of the genus *Tulbaghia* (sequence as in Vosa 2000 with one addition)

1. ***capensis*** Linnaeus, 1771
2. ***alliacea*** Linnaeus fil., 1781
3. ***cernua*** Avé'-Lallemant, 1884
4. ***ludwigiana*** Harvey, 1837
5. ***dregeana*** Kunth, 1843
6. ***tenuior*** Krause & Dinter, 1910
7. ***nutans*** Vosa 1975
8. ***macrocarpa*** Vosa, 1975
9. ***transvaalensis*** Vosa, 1975
10. ***acutiloba*** Harvey. 1854
11. ***simmleri*** G. Beauverd, 1908
12. ***galpinii*** Schlechter, 1894
13. ***leucantha*** Baker, 1897
14. ***natalensis*** Baker, 1891
15. ***verdoorniae*** Vosa & Burbigde, 1975
16. ***coddii*** Vosa & Burbidge, 1975
17. ***montana*** Vosa1975
18. ***cameroni*** Baker, 1878
19. ***rhodesica*** Fries, 1916
20. ***violacea*** Harvey, 1837

20a. ***violacea*** Harvey, 1837, var. ***maritima*** Vosa, 1975

21. ***cominsii*** Vosa, 1979
22. ***pretoriensis*** Vosa & Condy, 2006

## CONCLUSIONS

The bibliography clearly shows that, apart a few species, our knowledge of the genus *Tulbaghia* is in the main confined to the regions south of the river Limpopo. This surely may reflect the relative abundance of species in the southern geographical areas but may be due, at least in part, to certain logistic difficulties in the north. It is nevertheless true that many species have yet to be discovered further north and this is to be one of the objectives of further studies.

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