CHROMOSOME NUMBERS IN CERTAIN INDIAN SPECIES OF UTRICULARIA L. (LENTIBULARIACEAE)

BY K. SUBRAMANYAM, F.A.SC. AND N. P. KAMBLE

(Botanical Survey of India, Calcutta)

Received April 17, 1968

ABSTRACT

Chromosome numbers from meiotic studies have been reported for the following species of Utricularia: U. aurea Lour. \( n = 21 \); U. baouleghensis A. Chev. \( n = 10 \); U. caerulea L. \( n = 20 \); U. inflexa var. stellaris (Linn.f.) P. Taylor \( n = 21 \); U. minutissima Vahl \( n = 8 \); U. scandens Benj. \( n = 6, 7 \); and U. stricticaulis Stapf \( n = 7 \). There are two cyto-races in U. scandens.

INTRODUCTION

About 25 species of Utricularia occur in the Indian subcontinent; while some of them are aquatic, the majority are terrestrial and semi-marshy, and the remaining few are epiphytic. C. B. Clarke (1884) describes 22 species and in addition reports 10 imperfectly known species. Comparatively there is a dearth of information on the chromosome numbers of various Indian species of Utricularia. Kausik (1938) reports \( n = 20 \) for U. caerulea L., and Siddiqui (1959) \( n = 21 \) for U. flexuosa Vahl. Siddiqui found persistence of nuclei, nucleolar budding and fragmentation are normally present in U. flexuosa whose present nomenclature is U. aurea Lour. He further finds that abnormal cytokinesis occurs in some cases in this plant and cleavage starts at the dyad stage. Chromosome numbers during meiosis are reported for 7 species of the genus in the present study.

MATERIALS AND METHODS

Materials were collected from various places of India and these are given in Table I. The flower-buds for meiotic study were fixed in 1:3 acetic alcohol and also in Bouin’s fluid on warm sunny mornings between 9 A.M. and 11–30 A.M. It was found that Bouin’s fluid proved to be a better fixative. The fixed materials were treated with alkali-aldehyde following Tandler’s method (1959) and the staining procedure by Snow
K. Subramanyam and N. P. Kamble

(1963) was followed. The anthers were squashed in 1% aceto-carmine instead of 45% acetic acid and permanent preparations were made after removing the coverslip in tertiary butyl alcohol and finally mounted in euparal.

**Table I**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Taxon</th>
<th>Number</th>
<th>Origin and Voucher</th>
<th>Fig. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n=7</td>
<td>India: Assam, Elephant Falls, Shillong, 12/9, 1965, <em>Kamble</em> 10. CBLH.</td>
<td>8, 9</td>
</tr>
<tr>
<td>7.</td>
<td><em>U. stricticalulis</em> Stapf</td>
<td>n=7</td>
<td>India: Orissa, Balukhand R.F., 13/10, 1965, V. Abraham 266. CBLH.</td>
<td>10</td>
</tr>
</tbody>
</table>

* Herbarium, Central Botanical Laboratory, Botanical Survey of India, Calcutta.
**Chromosome Numbers in Certain Indian Species of Utricularia L.** 223

**Observations**

The chromosome numbers of various species of *Utricularia* along with field data are given in Table I.

**Results**

Meiosis in all these species is normal. The chromosome numbers were determined at diakinesis and metaphase I; anaphase I shows clearly the distribution of equal number of chromosomes towards each pole. The tetrads of microspores are formed in the normal manner. Among these reports five are new. The haploid chromosome numbers for *U. aurea*

![Diagram](image)

**Figs. 1–10.** Fig. 1. *Utricularia aurea*: Diakinesis showing $n = 21$ bivalents. Fig. 2. *U. baouleënsis*: Diakinesis showing $n = 10$ bivalents. Fig. 3. *U. caerulea*: Diakinesis showing $n = 20$ bivalents. Fig. 4. *U. inflexa var. stellaris*: Metaphase I showing $n = 21$ bivalents. Fig. 5. *U. minutissima*: Diakinesis showing $n = 8$ bivalents. Fig. 6. *U. scandens*: Diakinesis showing $n = 6$ bivalents. Fig. 7. *U. scandens*: Anaphase I showing equal distribution of chromosomes. Fig. 8. *U. scandens*: Diakinesis showing $n = 7$ bivalents. Fig. 9. *U. scandens*: Anaphase I showing equal distribution of chromosomes. Fig. 10. *U. stricticaulis*: Diakinesis showing $n = 7$ bivalents.
$n = 21$ and $U. caerulea \ n = 20$ confirm the previous reports of Siddiqui (1959) and Kausik (1938) respectively. The chromosome numbers for these plants reported here are however for plants collected from widely separated geographical regions.

It is also interesting to note that in $U. scandens$ there are two cytotypes. While the population of plants collected at Elephant Falls, Shillong, Assam, at an altitude of ca. 1710 M has $n = 7$, the population of the same species occurring in Sanyasi Malai Hills, Yercaud, Salem District, Madras State, at an altitude of ca. 1500 M, has $n = 6$, and this was observed in 98\% of the dividing microsporocytes.

It will be also seen from chromosome numbers given in Table I that there are both aneuploids and polyploids. Since some more species are under investigation it may be possible for providing some information on the basic numbers of members of this genus.

REFERENCES

Clarke, C. B. .... In Hooker, The Flora of British India, 1884, 4, 328.
Tandler, C. J. .... Ibid., 1959, 24, 234.