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Chromosome numbers in the *Pinguicula crystallina-hirtiflora* aggregate - a preliminary note.¹

Abstract

The chromosome number of *P. hirtiflora* TENORE from Rossano (Calabria, Italy) is $n=14$ and $2n=28$, respectively. *P. crystallina* SMITH in SIBTHORP et SMITH from Kakopetria (Church Ayios Nikólaos, Cyprus) and *P. louisi* MARKGRAF from Linza (Albania) has also $2n=28$ chromosomes.

Zusammenfassung

Die Chromosomenzahl von *P. hirtiflora* TENORE vom Fundort Rossano (Kalabrien, Italien) beträgt $n=14$ bzw. $2n=28$, die von *P. crystallina* SMITH in SIBTHORP et SMITH von Kakopetria (Kirche Ayios Nikólaos, Cypem) und von *P. louisi* MARKGRAF von Linza (Albanien) ebenfalls $2n=28$.

Introduction

The chromosome numbers of the taxa in the *Pinguicula crystallina-hirtiflora* complex are controverse. The most modern numbers cited in literature are $2n=27$ (Greece; STRID & FRANZÉN in LÖVE 1981; GOLDBLATT 1984)² and $2n=28$ (Cyprus, Italy; MIKELADSE 1996³; MIKELADSE & CASPER 1997:39). In all the cases it is about pure lists without intensive demonstration of the objects studied. These informations contradicts the former countings of $2n=16$ (HONSELL 1959; CASPER

¹ A detailed discussion of the the whole group will follow as soon as possible.

² The paper announced by PERUZZI, L., PASSALACQUA, N.G. and CESCO, G. 2003: *Pinguicula crystallina* Sibth. et Smith subsp. *hirtiflora* (Ten.) Strid (Lentibulariaceae) in Calabria (Southern Italy). Cytotaxonomical study and ex situ conservation in the Botanical Garden of Calabria University. - Carniv. Pl. Newsletter, was not available for us at the time of publication. In this paper also $2n=27$ for the Rossano Taxon is indicated.

³ TAMARA MIKELADSE; Der *crystallina-hirtiflora*- Sippenkomplex in der Gattung *Pinguicula*, mit besonderer Berücksichtigung von *P. crystallina*. - Diplomarbeit Friedrich-Schiller-Universität Jena 1996: 1-109; unpublished (Mrs. MIKELADSE-DVALI emigrated to America). The results of her chromosome countings are summarized in the concise contribution of MIKELADSE & CASPER (1997).

1962, 1966) or especially the detailed informations by CONTANDRIOPOULOS & QUÉZEL (1974: $2n = 16, 24, 32, 48$).

Apart from the countings of CONTANDRIOPOULOS & QUÉZEL (1974) who postulate different varieties (cf. CASPER 1970) founded on different ploidy levels the aberrant number $2n=27$ provokes severe investigation. In view of the fact that *P. crystallina* produces plenty of germinating pollen and seeds it seems doubtful that "triploidy" should be representative in the group. Thanks to the generosity of PD Dr. APPENROTH (Jena), Prof. Dr. ALFKO MHO and Prof. Dr. KASHA (Tirane) we could study living material of the Albanian locus classicus of the "lost" *P. louisii* MARKGRAF cultivated in the Botanical Garden of the Friedrich-Schiller-University Jena and compare it with plants of Italy (Calabria: Rossano)⁴ and Cyprus (Ayios Nikólaos).

Results

The haploid chromosome number of *P. hirtiflora*⁵ is $2n=14$ (Pl. 1, Figs. 1–3) in the material from Rossano (Calabria).

Because we were not able to find suited metaphase stages during the process of androspore development we studied mitose I in the young pollen grains. The formation of the pollen grains is normal. Nano- or macropollen rated about 2%.

From *P. crystallina* (Ayios Nikólaos, Cyprus) and *P. louisii* (Linza, Albania) we couldn't destinate the haploid number.

The diploid chromosome number of *P. hirtiflora* from Rossano is $2n=28$ (Pl. 1, Figs. 4–6). The material used for counting is from the base of young corolla lobes (cf. MIKELADSE 1996).

In material from *P. crystallina* (Ayios Nikólaos) we also counted $2n=28$ chromosomes (Pl. 2, Figs. 1–3). The informations by Mikeladse (1996) could be confirmed. In some cases lumping of chromosomes complicated exact counting. *P. louisii* from Linza (Albania) has $2n=28$ chromosomes (material of young leaf tips; Pl. 2, Figs. 4–6). The well development – rich production of flower buds – of the cultivated plants (BGJ) let us hope to find the haploid number in near future.

Discussion

From our investigations it is evident that the diploid chromosome number $2n=27$ (STRID & FRANZEN IN LÖVE 1981; GOLDBLATT 1984) must be a counting error. The best proof is the determination of the haploid number $2n=14$ during pollen grain mitosis I.

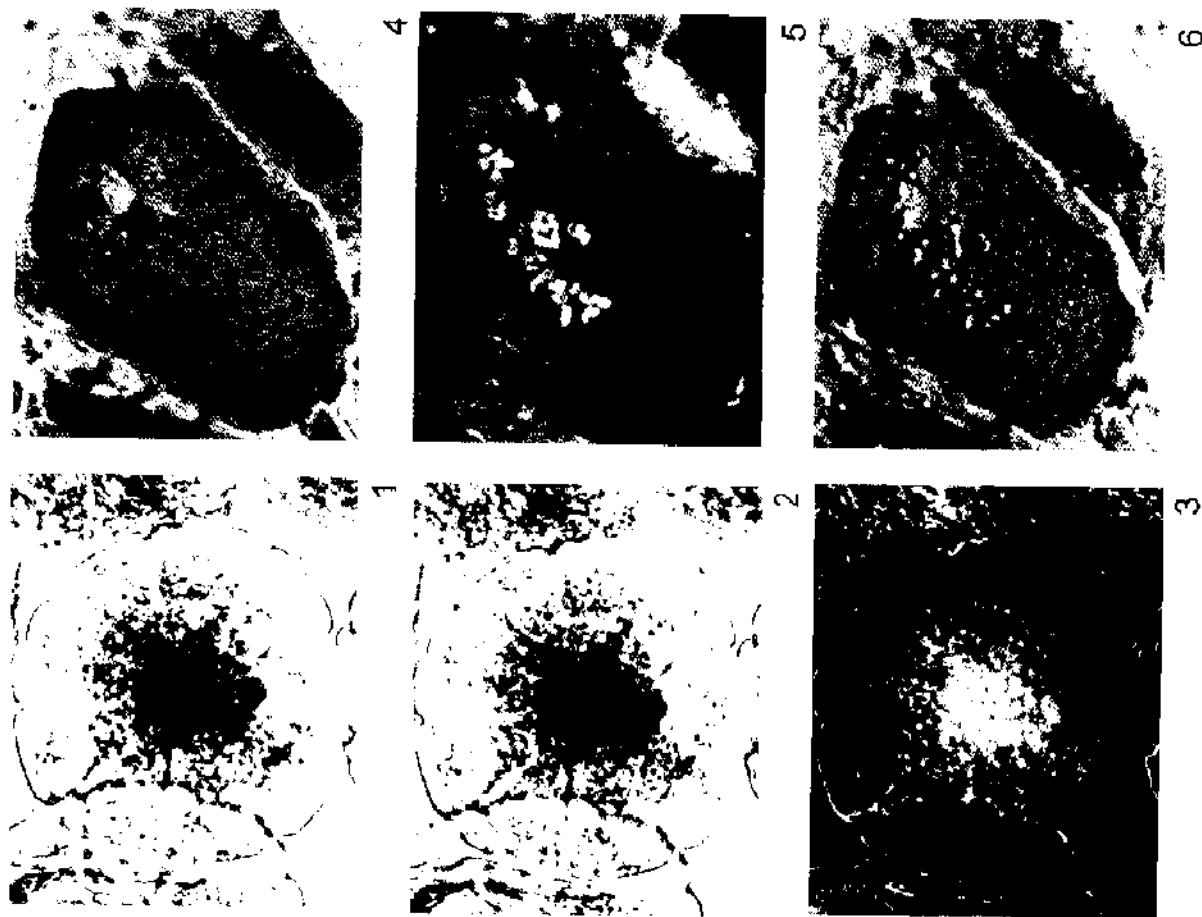
⁴ We are indebted to Prof. Dr. Jürg Stieger (Bern, Switzerland) for the living and conserved material of *P. hirtiflora* of the locality.

⁵ The nomenclature follows the proposals of CASPER 1996 and 1970, respectively.

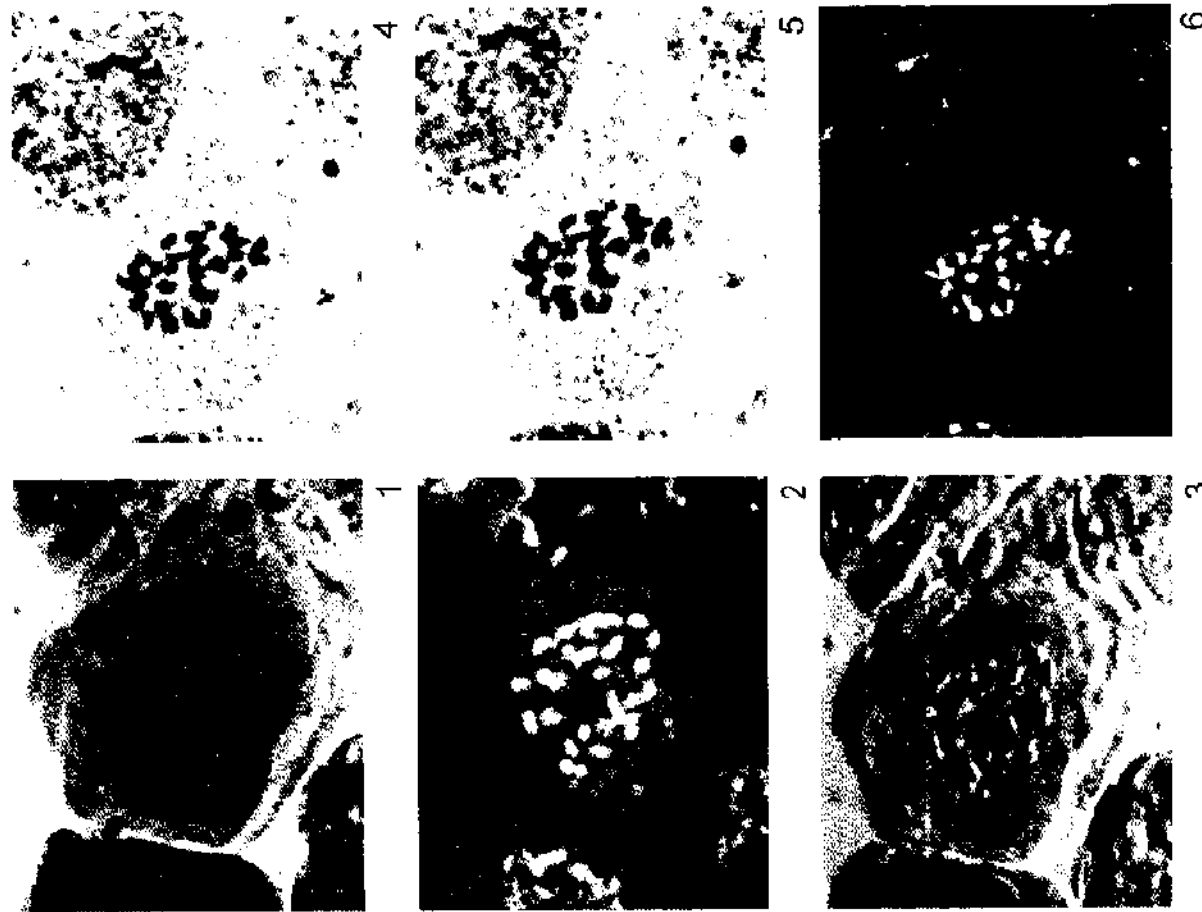
Counting of chromosomes in many *Pinguicula* taxa is a problem. The chromosomes mostly are small and incline to lump. The interpretation of our plates as a whole may be somewhat difficult. But at least for the existence of eu- or allopolyploid rows of chromosome numbers as CONTANDRIOPOULOS & QUÉZEL 1974 postulate we have not found any relevant information. This is so with our raw estimations of the chromosome numbers in material from Vietri, Vardousia, Ghitona, Prionia, and Megaspilaeon in the present case not discussed.

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Pl. 1, Figs. 1-3 *P. hirtiflora*, Calabria, Rossano - Pollen grain mitosis I; $n=14$, Figs. 1-2 different optical levels; Fig. 3 reverse view of Fig. 2; Figs. 4-6 *P. hirtiflora*, Calabria, Rossano. - Somatic mitosis in a cell at the base of a young corolla lobe; $2n=28$. Fig. 4 normal view; Fig. 5 reverse view of Fig. 4; Fig. 6 DIK of Fig. 4.



Pl. 2, Figs. 1-3 *P. crystallina*, Ayios Nikólaos (Cyprus). - Somatic mitosis in a cell at the base of a young corolla lobe; $2n=28$. Fig. 1 normal view; Fig. 2 reverse view of Fig. 1; Fig. 3 DIK of Fig. 1; Figs. 4-6 *P. louisiit*, Linza (Albania). - Somatic mitosis in a cell of a young leaf; $2n=28$. Fig. 4 normal LM view; Fig. 5 the same plate as in Fig. 4 at different level; Fig. 6 reverse view of Fig. 5.