

Standardized Photography of *Pinguicula* Blossoms

By Jurg F. Steiger (AUM, Inselspital 14, CH-1310 Berne, Switzerland)

In many plants, *exsiccata** have the disadvantage of a considerable information loss. In such cases color photography may offer a valuable additional source of scientific information.

I. Criteria for photographic scientific documents

To be qualified as *scientific documents*, photographs of biological objects should meet specific criteria, which are exemplified here particularly for plant photographs:

- 1) If the purpose is to depict a "typical" phenomenon within any species or plant population, it doesn't make any sense to photograph just the first specimen catching the eye. Before shooting any pictures, the range of variability within the investigated population must be identified. This will allow one to determine which phenomena are typical and less typical and to select and label the objects of photography accordingly.
- 2) Pictures in which the size of the object of interest is important but not clearly obvious should show the object together with a scale, preferably in metric measure.
- 3) Each photograph should have an identification number and the relevant data of each picture must be registered in any sort of a record system (card index, computer file etc.). In particular, it must be registered whether the photographed phenomenon displays predominantly typical or aberrant findings.
- 4) In a series of comparative pictures of similar objects, as many parameters as possible should be constant (general display, film format, film brand, background color and structure, illumination, focal distance, filters and

other accessories used, developing laboratory etc.).

- 5) Master negatives or master slides must be archived in a dark, dry place protected from extremely high or low temperatures in order to prevent any alterations.

II. The Record System

It is better to use consequently a *simple* record system than to use inconsequently a perfect but time consuming one, or to dream from a never used but constantly improved superperfect system.

I began to use a simple file system in 1957 which I find still suitable today with several thousand photographs and slides. Each negative or slide has a chronological number, beginning each year at zero. The first two digits are the year, the next digits indicate the slide number. "77.26" means 1977, slide No. 26. The file card of this slide has the same number. The cards have a size of 14,8 x 10,5 cm (European A6-format). Fig. (1) shows a translated file card of the slide with *Pinguicula grandiflora* blossoms depicted in this issue (the original text is in German):

The *file cards* are archived in cardboard boxes, *chronologically for each year*. The *photographs and slides* are stored in *separate boxes* and pooled for each *species*. Within one species the picture material is subdivided in further categories (habitat, habitus, blossoms, seed capsules, seeds, leaves, hibernacula etc.). This allows a quick and differentiated retrieval according to production year, species, intraspecies and interspecies criteria.

III. Standardized Photography

A few years ago I began systematically to photograph *Pinguicula* blossoms, seed capsules, winter buds, etc., as these are particularly predisposed to unfavorable altering by the pressing and drying process in conventional herbarium specimens. In order to get comparable pictures, blos-

* dried herbarium specimens

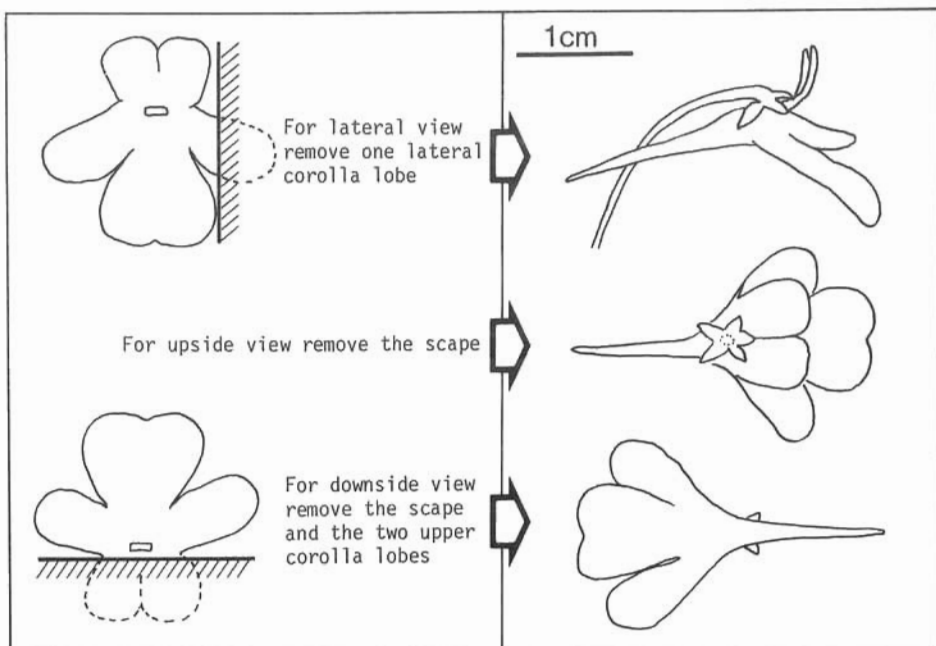


Fig. (1)

S = slide, P = paper picture, M = movie, BW = black and white, CO = color, DIN/ASA = film speed, SS = shutter speed (exposure), LO = lens opening (diaphragm).

som photography was standardized and after several trials with different blossom positions and background colors, the picture arrangement depicted in this paper was found to be most suitable.

In a trial series the slides of all species were photographed in the same absolute scale. The scale was determined by the largest blossoms (*Pinguicula moranensis*) with a flower length of more than 50 mm. However, for small species (*P. crenatiloba*, *P. villosa*) with blossoms of 5-7 mm, this results in ridiculous pictures with a tiny area of information surrounded by a giant uninformative background space. Therefore, it was decided to shoot the pictures in variable scales, allowing each set of three blossoms to fill out all the picture space. In another trial a fourth blossom was added, showing the blossoms in front view (a hole was cut into the background felt and the spur of the blossom was stuck into it). However, this was abandoned by reasons of circumstantiality and sometimes unsatisfactory depth of field.

For "typical" pictures of a species or population, three specimens are selected with "average" characteristics in size, shape and color. Additional comparative slides are made in cases where a conspicuous variability per se within a specific habitat is typical as shown in the examples of *P. longifolia* ssp. *reichenbachiana* and *P. moranensis* (color variations). Further slides are made to demonstrate other intra-specific differences (see examples of *P. macroceras* and *P. vulgaris*, each one growing on two different continents), differences between species or subspecies (see slide with the 3 "types" of *P. grandiflora*) and extreme variations (exuberant giant blossoms, nanism, shape or color deviations, atavisms and other aberrant findings). Similar standardized slides are being made from seed capsules, seeds, hibernacula, etc.

Technical procedure: To be able to position *Pinguicula* blossoms in lateral view it is often necessary to remove one lateral corolla lobe. For the blossom in downside-up position it is unavoidable to

OBJECT	<i>P. grandiflora</i> blossoms	SBW	PBW	MBW	NO: 72.17
		SCO	PCO	MCO	
ORIGINAL HABITAT	La Feuille 1320 m - Hironx 985 m Jura, France	DATE	28.5.70	NEGATIVE -	
CULTIVATION HABITAT	place #3	SINCE	30.5.70	FILM K-II	
PLACE OF PHOTOGRAPHY	Berne	DATE	4.6.72	DIN/ASA 155S $\frac{1}{2}$ LQ/6	
				CAMERA Cosina DL	
				PHOTOGR. J. Peisp	
REMARKS	Flash Optatron 3/8 Scale unit 1 mm Typical size, shape and color				

Fig. (2)

remove the scape and the upper corolla lobes (and sometimes the calyx). In the upside-up blossom the scape is just cut at its connection with the calyx (Fig. 2).

In case of difficulties in keeping the blossoms in place, I put some tiny lead balls into the corolla tube. Occasionally it is necessary to store already picked blossoms for some days in order to make a comparative slide with material to be gathered the next weekend. In this case, I put the blossoms into a tight plastic box coated on the inside with moist (not too wet), cotton wool or linsoft material. A fungicide is added to avoid mould. The box itself is put into the refrigerator at a place which does not freeze. In the coolness and fully water saturated atmosphere, the delicate blossoms are preservable and ready for photography up to two weeks.

Photographic equipment: Reflex viewfinder camera (Cosina DL) Lens 2,8/100 mm, extension tubes 11, 18 and 36 mm, three Hoya close-up lenses (1+, 2+,

3+), skylight 1B filter, tripod with a globular head to allow shooting in vertical direction, electronic flash (Rollei 134B or similar model), metric scale, green self adhesive felt background on a cardboard piece, a pair of tweezers. Film: Predominantly Kodachrome slide films. However, good results were also obtained with other brands. To avoid long-cast shadows, the flash must be positioned very close to the camera lens axis. Therefore, a usual 55 mm lens is not suitable as there is generally not enough space to approximate the flash tube axis. The slide with *P. alpina* shows such a 55 mm lens picture with unpleasant shadows. Unless working with a fully self regulating feedback computer flash, it is necessary to determine the correct distance between flash and object for each object length by means of a test series.

All this equipment is packed up in a portable box and is ready for use anywhere, at home as well as in the field or in a tent. Much better and more sophisticated photographic hardware is on the



1. *P. alpina*



2. *P. balcanica*



3. *P. corsica*



4. *P. grandiflora*



5. *P. grandifl. f. pallida*



6. *P. grandifl. ssp. rosea*



7. *P. grandifl./f. pallida/
ssp. rosea*



8. *P. leptoceras*



9. *P. longifolia ssp.
caussensis*



10. *P. longifolia* ssp.
longifolia



11. *P. longifolia* ssp.
reichenbachiana



12. *P. longifolia* ssp.
reichenbachiana



13. *P. macroceras* (Japan)



14. *P. macroceras* (USA)



15. *P. macroceras* ssp.
nortensis



16. *P. nevadensis*



17. *P. vallisneriifolia*



18. *P. vulgar/f. bicolor*,
f. albida

market today. However, flexible, rather simple amateur equipment as described above may well serve to shoot acceptable slides for many years.

IV. Comments on the color plates

The pictures show blossoms of the majority of the temperate growth type *Pinguicula* species (including one natural hybrid) and of four tropical growth type species (each group in alphabetical order). The length of the horizontal black stroke in the upper left corner of each picture is 1 cm.

With the exception of *P. corsica*, Japanese *P. macroceras*, *P. gypsicola* and *P. moranensis*, all other depicted specimens were collected by the author personally at the indicated localities. All photographs are by the author. The nomenclature follows the very well documented *Pinguicula* monograph by Casper (1966).

The abbreviations in the following indications mean:

LC = Locality of collection
LP = Locality of photography
K = Kodachrome

Temperate growth type species (alphabetically)

1. *P. alpina* — LC/LP Schwarzwasserbrücke 650 m, near Berne, Switzerland, 22.5.72 (K-II)
2. *P. balcanica* — LC between Hotel Shtastliveca and Cerni Vrach, Vitosha, 2290 m, near Sofia, Bulgaria, 17.9.76, LP Trogenmoos near Interlaken, Switzerland, 16.7.77 (K-25)
3. *P. corsica* — LC Lac de Melo, 1650 m, Vizzavona, Corsica, France, 24.8.69 (by Mrs. M. Conrad), LP Berne, Switzerland, 27.7.70 (K-II)
4. *P. grandiflora* — LC between Col de la Faucille, 1320 m and Mijoux, 985 m, Dept. Jura, France, 28.5.70, LP Berne, Switzerland, 4.6.72 (K-II)
5. *P. grandiflora f. pallida* — LC between Col de la Faucille, 1320 m and Mijoux, 985 m, Dept. Jura, France, 28.5.70, LP Berne, Switzerland, 10.6.70 (K-II)
6. *P. grandiflora ssp. rosea* — LC above Goncelin/Sollières, 600 m, near Grenoble,

Dept. Isère, France, 3.8.73, LP Berne, Switzerland, 23.5.74 (K-II)

7. *P. grandiflora f. pallida ssp. rosea* — LC *P. grandiflora* and *f. pallida* see Nr. 4 and 5, *P. ssp. rosea* see Nr. 6 but collected on 28.5.70, LP Berne, Switzerland, 24.6.70 (K-II)
8. *P. leptoceras* — LC below Grimselpass, ca. 1900 m, Switzerland, 16.8.68, LP Berne, Switzerland, 11.7.70 (K-II)
9. *P. longifolia ssp. caussensis* — LC below St. Enimie, ca. 420 m, Gorges du Tarn, Dept. Lozère, France, 4.9.68, LP Berne, Switzerland, 2.5.76 (Ektachrome-X)
10. *P. longifolia ssp. longifolia* — LC below Cirque de Gavarnie, ca. 1600 m, Dept. Hautes-Pyrénées, France, 22.8.69, LP Berne, Switzerland, 28.7.70 (K-II)
11. *P. longifolia ssp. reichenbachiana* — LC above Nizza, between Fontan and Tende, ca. 550 m, Dept. Alpes-Maritimes, France, 8.9.68, LP Berne, Switzerland, 2.5.76 (Ektachrome-X)
12. *P. longifolia ssp. reichenbachiana* — same data as No. 11, in contrast to the two other sub-species, this one has a conspicuous colour variability.
13. *P. macroceras* (Japan) — LC below Mount Nantaizan, ca. 2300 m, near Nikko, Tochigi Pref., Japan, 11.10.68 (by M. Kondo), LP Berne, Switzerland, 12.7.70 (K-II)
14. *P. macroceras* (USA) — LC upper Bagley Lake, Mt. Baker Lodge, ca. 1600 m, Whatcom County, Washington, USA, 29.8.71, LP North Bend near Seattle, USA, 30.8.71 (K-II)
15. *P. macroceras ssp. nortensis* — LC Sheep Pen Creek, ca. 1000 m, between Crescent City and Gasquet, Del Norte County, California, USA, 7.5.71, LP Los Angeles, USA, 10.5.71 (K-II)
16. *P. nevadensis* — LC Laguna de las Yeguas, 2850 m, Mt. Veleta, Sierra Nevada, Spain, 18.8.69, LP Silvaplana, Switzerland, 31.7.70 (K-II)
17. *P. vallisneriifolia* — LC Cueva de la Madalena, ca. 1200 m, Iruna, Sierra de Cazorla, Spain, 20.8.69, LP Berne, Switzerland, 10.6.70 (K-II)
18. *P. vulgaris f. bicolor f. albida* — LC *P. vulgaris* and *f. albida* Grönenbergpass, 1500 m, near Interlaken, Switzerland, 26.6.76, *f. bicolor* see Nr. 21, 3.6.67, LP Trogenmoos, near Interlaken, Switzerland, 26.6.76 (Agfa CT-18)
19. *P. vulgaris* (Europe) — LC Col des Montets, 1445 m, Switzerland, 13.8.70, LP

Trogenmoos, near Interlaken, Switzerland, 16.8.70 (K-II)

20. *P. vulgaris* (USA) — LC Pictured rocks, ca. 200 m, Lake Superior, near Munising, Michigan, USA, 26.9.71, LP Berne, Switzerland, 21.5.72 (K-II)
21. *P. vulgaris* f. *bicolor* — LC Les Amburnex, near Col du Marchairuz, 1450 m, Jura, Switzerland, 3.6.67, LP Berne, Switzerland, 11.7.70 (K-II)
22. *P. hybr. leptoceras* x *vulgaris* (or vice versa) — LC Oberalp-Pass, ca. 2000 m, Switzerland, at common locality of both parent species, 30.7.70, LP Berne, Switzerland, 12.7.72 (K-II)

Tropical growth type species (alphabetically)

23. *P. gypsicola* — LC ?, cultivated at the Botanical Garden, University of Berne, Switzerland, LP Berne, 29.8.70 (K-II)
24. *P. hirtiflora* — LC Valle delle Ferriere, ca. 200 m, above Amalfi, near Naples, Italy, 29.6.76, LP Amalfi, Italy, 2.7.76 (Agfa CT-18)
25. *P. lusitanica* — LC Lake Goller, ca. 280 m, near Lisdoonvarna, Clare County, Ireland, 31.5.75, LP Trogenmoos, near Interlaken, Switzerland, 11.8.75 (K-64)
26. *P. moranensis* — LC ?, cultivated at the Botanical Garden, University of Berne, Switzerland, LP Berne, 29.8.70 (K-II)
27. *P. moranensis* — LC/LP see Nr. 26, three color variations

V. Suggestions to CPN Readers

Regarding the fact that this bulletin now offers publication of color pictures, the following suggestions are made:

1. Other CP growers with photographic interests adopt the described technique for pictures of *Pinguicula* blossoms and send their slides to the editorial board. As soon as there is a pool of some new slides, they are published in another issue of this bulletin. The final objective would be to have a multi-authored but standardized photographic color documentation of each of the 49 *Pinguicula* species.
2. CP growers specialized more in *Utricularia*, *Drosera*, *Sarracena*, *Nepenthes* etc. are encouraged to develop similar methods of standardized photography

for these CP. Such activities should be reported to the editorial board to facilitate coordination.

3. The author will offer free of charge 5 different duplicates of the depicted color slides to each one of the first three persons who send him at least one color slide of *Pinguicula* blossoms photographed in the proposed manner (preferably from other species than those depicted in this paper).

VI. References (for nomenclature)

Casper S. J., On *Pinguicula macroceras* in North America, *Rhodora*, Vol. 64 (1962) pp. 275-292

Casper S. J., Monographie der Gattung *Pinguicula*; Biblioteca botanica, Vol. 127/128, Stuttgart (1966)

Steiger J. F., The *Pinguicula* Species of the Temperate Growth Type and their Cultivation, *Carnivorous Plant Newsletter* Vol. IV, NO. 1 (1975), pp. 8-18

VII. Acknowledgements

I thank the following persons and institutions for having provided me with plant material depicted in this paper: M. Kondo, Nagoya (for *P. macroceras*, 1968), Mrs. M. Conrad, Bastia (for *P. corsica*, 1969), University of Berne Botanical Garden (for *P. gypsicola* and *P. moranensis*, 1970).

NOTICE: We believe many readers would be interested in having 35 mm duplicate slides of the color illustrations in Jurg Steiger's paper on color photography of *Pinguicula* flowers printed in this issue. Jurg has kindly given us permission to duplicate the original slides, which are of excellent quality, and these will be held as sets for cost of duplication plus postage and packaging. We did not have time to get together the pricing workup on this before this issue went to press, but the September issue will contain details on how to obtain these slide sets.



19. *P. vulgaris* (Europe)



20. *P. vulgaris* (USA)



21. *P. vulgaris* f. *bicolor*



22. *P. leptoceras* x *vulgaris*



23. *P. gypsicola*



24. *P. hirtiflora*



25. *P. lusitanica*



26. *P. moranensis*



27. *P. moranensis* (color variation)