

**A new *Pinguicula* (Lentibulariaceae) from the
pre-alpine region of northern Italy (Friuli-Venezia Giulia):
Pinguicula poldinii Steiger et Casper spec. nov.**

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Summary: We describe a new species of the genus *Pinguicula* (Lentibulariaceae), *P. poldinii* Steiger et Casper. For the present we classify the new taxon as belonging to the sectio *Pinguicula* without a specified series allocation. It was detected by Gianfranco Tonussi (Reana del Roiale) and Prof. Dr. Livio Poldini (Trieste) in 1991. It grows in the colline region of the north-east Italian prealps (Friuli-Venezia Giulia: Prealpi-Carniche; A. B. 9643/3) on steep water-oozed rocks.

Zusammenfassung: Wir beschreiben eine neue *Pinguicula*-Art, *P. poldinii* Steiger et Casper, die wir in die Sektion *Pinguicula* stellen, vorläufig darauf verzichtend, sie einer bestimmten Series zuzuordnen. Sie wurde im Jahre 1991 von den Herren Gianfranco Tonussi (Reana del Roiale) und Prof. Dr. Livio Poldini (Trieste) an steilen, wasserüberrieselten Felswänden in der kollinen Höhenstufe der nordostitalienischen Voralpen (Friuli-Venezia Giulia: Prealpi Carniche; A. B. 9643/3) entdeckt.

Keywords: *Pinguicula poldinii* Steiger et Casper spec. nov., *Pinguicula*, Lentibulariaceae, north-east Italian Alps (Prealpi Carniche)

When studying the alpine *Pinguicula*-species in the fifties and sixties of the past century one of us – CASPER (1959, 1962, 1966, 1974) – could not understand the striking distribution gap between the easternmost part of the distribution area of *P. leptoceras* (Hohe Tauern – see HARTL et al. 1992: 273; Dolomiti – see POLDINI 1991: 581) and the westernmost parts of the *P. balcanica* distribution (Dinaric Alps). Theoretically, from the geographical, oreographical and climatic points of view there should be sites of *Pinguicula* members of the *leptoceras*- or *balcanica*- (sometimes falsely called *longifolia*-) group in the region south of the Carnic main ridge and north of the plain of the Po stream. But neither Austrian or Italian nor Slovenian botanists did succeed in finding any trace of such a species. On the contrary, the distribution atlases of HARTL et al. (1992: 273) and POLDINI (1991: 580–581) seem to confirm the total lack of species of the sectio *Pinguicula* in the region mentioned with exception of the widespread *P. vulgaris*.

Therefore, it was a great surprise and came up to a sensation when in 1991 the amateur botanist Gianfranco Tonussi from Reana del Roiale (UD) informed Prof. Livio Poldini from Trieste about a beautiful *Viola*-like *Pinguicula* which he had detected in narrow deep gorges in the prealps of the region Friuli-Venezia Giulia south respectively west of the river Tagliamento. The plant with relatively large blue-violet open flowers could not exactly be determined by the floristic literature available. In the following years, Prof. Poldini repeatedly visited the site with colleagues from Italy, Germany and Switzerland. The idea materialized, especially by the second author Steiger, the 'Friuli'-*Pinguicula* to be a new species hitherto unknown to botanical science. In the meantime some additional habitats have been detected.

In 1998, during a visit of Casper at Bern, when scrutinizing Steigers' coloured photographs of the plant and dried specimens from the original site, both of us were in full agreement about the striking peculiarities of the 'Friuli'-*Pinguicula*. It seemed to be the 'missing link' Casper

had ever looked for. Without any doubt, *Pinguicula poldinii* belongs to sectio *Pinguicula* sensu lato (CASPER 1962) possibly forming a series by its own (e.g. ser. *Prealpicae*). Nevertheless, at the present time we don't fix its taxonomical position below sectio level.

Results

The 'Friuli'-*Pinguicula* is distinguished by its beautiful shining blue-violet open bilabiate flower with a relatively high reddish portion in the colour pattern and – suprisingly – with a remarkable morphological and numerical variability of the flower parts, by the upper lip distinctly arising, the lower lip loping, resulting in a corolla somewhat similar to the wide-open flowered butterworts of the *longifolia*-group (opening-angle more than 120°). The pattern of the corolla lobes is composed of violet and white stripes which run together at the lobe basis into whitish patches; the lobes are sparsely beset with glands and clavate hairs. The calyx lips are bright green, their lower lip normally divided to the middle. The relatively long spur is very thin and obtuse to pointed. The leaves of the homophyllus rosette appressed to the ground are greenish in shadow and intensively brown-red in full sunshine. It grows on naked rocks as well as in moist meadows.

The distribution of this *Pinguicula*-species seems to be very restricted (Carnic Prealps between Tolmezzo and Udine). It has no connection with the huge but disjunct area of those *Pinguicula*-taxa forming in Italy a chain of (not well known) vicarious species of the so called *longifolia*-group extending along the peninsula throughout the mountain regions from the Alpi Marittime across the Appennino Ligure, App. Tosco-Emiliano, App. Abruzzese, and the Maiella. The presently known distribution of *P. poldinii* starts near the eastern border of the distribution area of *P. leptoceras* (POLDINI 1991) but the two taxa exclude one another, i.e. they are allopatric. *P. poldinii* reaches its eastern border in the region where the Tagliamento stream turns to the south (between Tolmezzo and Gemona del Friuli). In this small area it is usually sympatric with *P. alpina* as is evident from POLDINI's distribution map (1991: 580). Also *P. vulgaris*, long ago known in this region (GORTANI & GORTANI 1905: 128, 1906: 389), was recorded by POLDINI (1991: 1922) but not at the recent sites of *P. poldinii*.

Diagnosis simul descriptio

Pinguicula poldinii Steiger et Casper spec. nov.

Herba perennis rhizomate brevi simpliciter adscendente; radicibus adventitiis numerosis filiformibus. *Folia* radicalia rosulata, rosula homophylla; solum adpressa, pauci, (4)5–6(8); lamina ambitu ovato-oblonga, obtusa, 2–4plo longiora quam latiora, (22)25–35(39) mm longa (sine petiolo), (5)7–10(13) mm lata; basi in petiolum ~8–9 mm longum sensim attenuata; scapo breviora; superiore glanduloso-viscosa; in locis umbrosis (supra locis herbis siccis irriguis) viridia, in locis soli expositis (supra rupibus praeruptis) rubiginosa; margine haud involuta. *Scapi* 1–4(6), erecti, teretes, filiformes, parum glandulosi, (32)45–70(78) mm alti, uniflori. *Flores* magni, (21)24–28(32) mm longi (calcarei incluso). *Calyx* distincte bilabiatus, laete viridis, soli expositus et maturitatis subfuscus, persistens, glandulosus; tubum corollae multo breviora; labium superum regulariter profunde trilobum saepe irregulariter profunde quatuor- vel

¹ The epithet was chosen in honour of Prof. Dr. Livio Poldini, Triest, who is one of the most experienced and engaged explorers of the flora and vegetation of this region. He has published a great number of taxonomical, phytogeographical and syntaxonomical papers as well as his 'Atlante corologico delle piante vascolari nel Friuli-Venezia Giulia' (1991), a comprehensive and convincing presentation of the recent results of his floristic data base work.

quinguelobum, lobis oblongis basin versus vix angustatis, vel ovato-oblongis basin versus distincte angustatis, apice obtusis vel retusis vel acutis (lobo medio saepe bi- vel tripartito), duplo vel triplo longioribus quam latioribus; labium inferum regulariter subintegrum vel (maxime) usque ad $2/3$ longitudinis bilobum (rare irregulariter tri- vel quatuorlobum). *Tubus* brevis, infundibuliformis, ~5–8 mm longus et latus, ad faucem late ampliatus; faux albido-pilosa; sine palato. *Calcar* rectum vel subincurvum, magis tenue, subacutum. *Corolla* nitens caeruleo-violacea, sparse glandulosa, striis albidis-violaceis delineata, basin calcarata versus macula albida dilatata, late ampliata, bilabiata, calyce multum longiora; labia distincte inaequalia; labium superum regulariter bilobum (rare trilobum), lobis oblongis apice obtusis, ~5–7 mm longis, maxime duplo longioribus quam latioribus, antice distincte erectis et revolutis; labium inferum regulariter trilobum interdum irregulariter quatuor- vel quinguelobum, lobis magis longioribus quam latioribus, ~9–11 mm longis, inter se inaequalibus (lobo medio plerumque distincte longiore quam lobi laterali, apice saepe paulo dilatato, distincte dependente), non vel vix tegentibus, oblongis, apice obtusis, basin versus vix attenuatis, (7)9–11(13) mm longum, limbum corollae subaequantem. *Stamina* 2, basi ovarii adnata; filamenta breves, incurvata; antherae 2, thecis connatis. *Granula pollinis* subglobosa-prolata, ~30 μm in diametro, (zono-)6–8 colorata. *Ovarium* superum, sessile, ~2 mm in diametro, subglobosum, uniloculare, in stylum brevissime productum; ovula plura placentae centrali liberae sessilia; stigma terminale brevissime inaequaliter bilobum, fimbriatum, antheris umbrelliformiter obtegentum. *Capsula* globosa, ~5 mm in diametro, unilocularis, bivalvis, fusca, calyce persistente paulo breviora, subinclusa. *Semina* late cylindracea, 0,6–0,7 mm longa, scobiformes, brunnea; testa reticulata. *Hibernacula* 7–11 mm longa, 5–8 mm in diametro, partes expositae luci purpureae-brunneolae, plerumque cum aliquot *gemmis*. – Floret: V; fructifer: V–VI.

Pinguicula poldinii differt a speciebus similibus:

Differt a *P. vulgari* L. magnitudine floris; corolla late ampliata, lobis labii superi valde reflexis, lobo medio labii inferi pendulo; calcari magis longiore; capsula globosa.

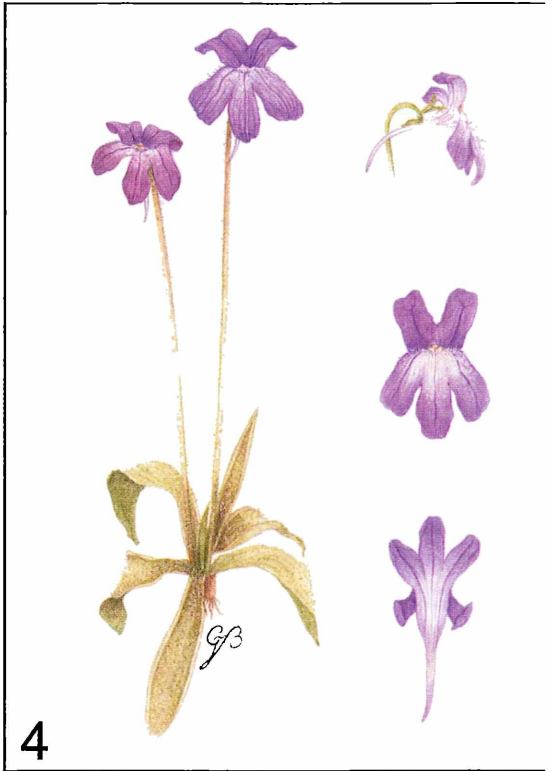
Differt a *P. leptocerate* Reichenbach magnitudine floris; corolla late ampliata cum labii superi lobis valde reflexis, lobis labii inferi oblongis, non rotundatis, inter se non tegentibus; striis longitudinalibus albo-violaceis corollae; labio supero calycis valde tripartito; lobis labii inferi calycis plerumque non divaricatis; calcari longiore; habitatione in altitudinis magis inferioribus.

Differt a *P. balcanica* Casper magnitudine floris; corolla late ampliata cum labii superi lobis valde reflexis, lobo medio labii inferi pendulo; calcari longiore; capsula globosa; habitatione in altitudinis magis inferioribus.

Differt a *P. reichenbachiana* Schindler striis longitudinalibus albo-violaceis corollae; lobis labii inferi calycis plerumque non divaricatis; rosula homophylla; foliis non erectis, solum 3–4plo longioribus quam latioribus.

Differt a *P. fiorii* Tammaro et Pace magnitudine floris; corolla aliquot rubelliora; striis albo-violaceis maculisque albidis corollae; calcari magis longiore; calyce pro ratione parvo; capsula globosa.

P. poldinii etiam differt a speciebus hic enumeratis magna proportione florum cum 6–7(–8) lobis corollae calycisque.



Holotypus: [sine nomine] Flora Italiae: prov. Pordenone. Prealpi Carniche: Val di Cuna (Valle dell' Arzino) A. B. 9643/3; ca. 500 m s.m. in rupibus calcareo-dolomiticis madidis. 05. 1996. leg. L. Poldini – (TSB !).

Habitatio: In regione collina montium prealpium Italiae, Friul-Venezia Giulia; in faucibus profundis rupibus praeruptis locis udis (locis herbidis siccis umbrosis vel soli expositis, aquae madidis); altitudine 450–550 m supra mare.

Herb perennial, small, rosette forming, scapose, succulent. *Stem* short, with ascending, not branching rhizome and numerous adventitious fibrous roots. *Rosettes* to ~30–60 mm in diameter with few, (4)5–6(8) leaves lying flat on the ground; homophyllus. *Leaves* in outline obovate-oblong, obtuse at the apex, narrowed at the base, 2–4 _ as long as broad, (22)24–35(39) mm long (without petiole), (5)7–10(13) mm broad, \pm flat (up to 2 mm thick), at the base narrowed in a petiole 8–9 mm long; shorter than the scape; the margin entire, sometimes slightly incurved; brittle; the upper surface densely covered with mucilaginous sessile and stalked glands; on shadowed stands pale-green, in the bright sun intensively purple-brown. *Scapes* 1–4(6), erect, (32)45–70(78) mm [bearing ripe fruits up to 115 mm] tall, terete, tapering from about 2 mm thick at the base to about 1 mm thick at the apex, 1-flowered, directly beneath the flower densely covered with stipitate glands, to the base sparsely glandular. *Flowers* relatively large, (21)24–28(32) mm long (spur included). *Calyx* distinctly bilabiate, green, in bright sun and at fruiting-time brownish, densely covered on both surfaces and the margins with stipitate glands, ~8–10 mm in total diameter, much shorter than the tube; upper lip divided nearly to the base into 3(–6) lobes, the lobes ovate-oblong to oblong (the middle lobe sometimes larger than the lateral lobes and at the apex slightly truncate or at the margins somewhat pointed), 2–3 x as long as broad; lower lip divided to 1/6 (maximum 1/2) into 2 very short obovate to ovate or \pm acute lobes. *Tube* broadly funnel-shaped, short, ~5–8 mm long and at the entrance to the throat just so wide, without palate, but relatively densely covered with clavate hairs. *Spur* straight or incurved (making an acute angle with the tube), thin, at the insertion at the base of the tube ~2 mm thick, tapering to the pointed or obtuse apex, ~0.5 mm thick, (7)9–11(13) mm long, nearly as long as the corolla lip. *Corolla* distinctly bilabiate, shining blue-violet, lobes and tube with violet and whitish striae, at the throat white, spur violet to whitish; upper lip with 2 oblong nearly identical lobes, 1.5–2 x as long as broad, ~5–7 mm long, erect, apex subtruncate to rounded, externally much sparsely covered with stipitate glands, internally with longer clavate hairs near the basis; lower lip much larger than the upper lip, with 3 (sometimes 4–6) lobes, apex rounded to slightly truncate, externally sparsely covered with stipitate glands, internally in the middle zone with very long stalked headed, at the base near the throat with somewhat shorter, clavate hairs; lobes oblong to obtusate, unequal and usually not overlapping, the middle lobe distinctly longer and broader than the lateral lobes, apex rounded and somewhat dilatate, to the base meagre narrowed, ~9–11 mm long, 5–7 mm broad, front part of the lobes bending downwards: the whole corolla appears wide open (opening-angle ~120–180°) and enlarged, the white haired throat is open, too. *Stamens* ~2 mm long, the short filaments slightly incurved. *Anther* thecae \pm confluent roofed

Figures 1–4: *Pinguicula poldinii* (figure 2 also includes *P. vulgaris*). 1) Shows each a flower with 6, respectively 7 corolla lobes. At some sites up to 40% of the flowers have surplus corolla lobes and calyx tips. 2) Habitus. 3) Prof. L. Poldini with a student at the holotypus site (Canale di Cuna). 4) Watercolour painting by Gloria Bolognini. (Photographs: J. Steiger; 2 from the site on the road above San Francesco, 1 & 3 from the holotypus site, Canale di Cuna)



by the larger fringed lip of the stigma. *Pollen* grains (zono-)6–8 colpiate, prolate to globose, ~30 µm in diameter. *Ovary* subglobose, sessile, ~2 mm in diameter, densely stipitate-glandular, 1-loculate, ending in a short style; central placenta free, with numerous free sessile ovules. *Stigma* short, bilabiate, the lower lip broad, fringed, the upper lip much smaller, narrowly oblong, fringed. *Capsule* globose, ~5 mm in diameter, 1-loculate, brown, much shorter than the persistent calyx, first included by it, later, at maturity opening by 2 valves. *Seeds* minute, like sawdust ('scobiformis'), broad cylindrical, ~0.6–0.7(0.8) mm long, ~0.3–0.4 mm thick, surface reticulate, shining brownish. *Winter buds* 7–11 mm long, 5–8 mm in diameter, light-exposed parts purple-brownish, usually with a few *brood buds*. – Flowering: V; fruiting: V–VI.

Pinguicula poldinii is distinguished from similar *Pinguicula*-species especially by its widely open, shining blue-violet corolla which reminds to species of the series *Longifoliae* sectio *Pinguicula*. No doubt, especially the flower of *Pinguicula longifolia* Ramond sensu stricto from the Pyrenees for instance bears related features [this may be the reason why Schlauer (1999, in sched.) determined our taxon as *Pinguicula longifolia* s. lat.] but it is distinct by several peculiar characteristics.

In particular, the differences between *Pinguicula poldinii* and the 'related' European taxa of sectio *Pinguicula* are:

Compared to *P. vulgaris* L.: the much larger flower; the widely open corolla, with suberect-recurved upper corolla lobes and the loping central lower lobe; the much longer spur; the globose seed capsule.

Compared to *P. leptoceras* Reichenbach: the larger flower; the widely open corolla, with suberect-recurved upper lobes, the oblong, at the apex not rounded and not or barely overlapping corolla lobes; the longitudinal white/violet striped pattern of the corolla; the deeply tripartite upper calyx lip and the usually much less divided lower calyx lip; the longer spur; the occurrence in much lower altitude.

Compared to *P. balcanica* Casper: the larger flower; the suberect-recurved upper corolla lobes and the loping central lower lobe; the longer spur; the globose capsule; the occurrence in much lower altitude.

Compared to *P. reichenbachiana* Schindler: the longitudinal white/violet striped pattern of the corolla; the usually less divided lower calyx tips; the homophyllus rosette; the non-erect leaves which are only 3–4 x longer than broad.

Compared to *P. fiorii* Tammara et Pace: the larger flower; the somewhat more reddish corolla; the white/violet striped pattern and the white spots of the corolla; the much longer spur; the relatively smaller calyx; the globose seed capsule.

P. poldinii also differs from all above named species by its high proportion of flowers with each 6–7(–8) corolla lobes and calyx tips.

Figures 5–11: *Pinguicula poldinii* (figure 7 also includes *P. vulgaris*). 5) Habitus. 6) Flowers. 7) Flowers, on top for comparison a *P. vulgaris* from Blejdsko Jezero, north-western Slovenia (where its blue-violet colour is conspicuously intensive, much darker than in *P. vulgaris* of western Europe). 8) Habitus. 9) Flowers; deeply separated lower calyx tips as in the specimen at the bottom right are rather the exception. 10) Fruits, 1–2 days before the capsule begins to dry out. 11) Winter buds; end of February, just beginning to spread. At the basis some brood buds. (Photographs: J. Steiger; 5–9 & 11 from the site on the road above San Francesco, 10 from the holotypus site, Canale di Cuna)

Specimina visa: • “Norditalien, Friaul-Julisch Venetien sw Tolmezzo; ca. 1,5 km N der Kirche von S. Francesco; 450 m ü. M. 12.05.1999; leg. J. Steiger – JE ! – sub *Pinguicula poldinii* J. Steiger et S. J. Casper“ – apophytic site. – • “Norditalien, Friaul-Julisch Venetien sw Tolmezzo im Val d’Arzino, nördlich des Gemeindeverbandes San Francesco an der Straße nördlich und südlich des Straßensteins 75 in der Umgebung der Kapelle (des ‘Martelrs’) San Antonio; an westexponierten, vom Tropfwasser (pH 7,5) überrieselten Karbonat-(Hauptdolomit-) Felsen, an künstlich angelegten Wasserabläufen und im unmittelbar angrenzenden *Sesleria albicans*-Rasen, 450 m ü. M.; 05.05. und 09.05.2000; leg. J. & R. Casper, W Spanowsky und E. Hübl – JE ! – sub *Pinguicula poldinii* J. Steiger et S. J. Casper“ – apophytic site. – • “18.4.1998. Nähe Brücke Punkt 467, 3 km Luftlinie W von San Francesco. W-Seite des Flusses. Kalk. – natural site (scripsit J. Steiger).– • Westlich der Sella Giâf nördlich der Brücke [über die Cuna], 505–550 m, SE-exponierte Kalkfelsen – leg. L. Poldini, ..., J. Schlauer, J. Nerz, H. Rischer, Marilène Grob und J. Steiger“ – natural site (scripsit J. Steiger). – [The last two labels refer to the same event].

Specimina non visa: “22.05.1997(?), [bei San Francesco] Canale di Cuna westlich der Sella Giâf, ca. 480 m – leg. L. Poldini“ (TSB – identical with the holotype ?). – • Val Campone (9742/2) südlich von Tramonti di Sotto, an einer berieselten senkrechten Felswand mit Tuffbildung – leg. L. Poldini (TSB) – [mail from May 20, 1999 to J. Steiger].

Discussion

Pinguicula poldinii is a very beautiful taxon of the genus because of its relatively large graceful blue-violet widely open corolla (upper and lower lip forming an angle of 120°–180°). In flower it cannot be mixed up with any other species of the region. Although growing at similar habitats as *P. reichenbachiana* (Alpi Marittime, Alpi Apuane), its leaves are remarkably different: while *P. reichenbachiana* forms a heterophyllus summer rosette with erect or semi-erect longer leaves, *P. poldinii* remains homophyllus, i.e. the spring rosette with the mostly flat-laying leaves persists till autumn. In spite of the high morphological and quantitative variation in the flower complex fruiting and seeding are normal. The seeds germinate immediately after maturity. The pollen is fertile to nearly 98%. We have not yet counted the chromosome number of *P. poldinii* but we expect it to be one of the tetraploid ($2n = 32$) species.

On steep rocks in Val d’Arzino north of San Francesco we found four populations along the wet uphill border of the road – with roughly 1000 specimens – from the road level to about 1.5 m above the road. The majority of these sites are likely to have been created while digging away the uphill rocks for the road construction. Wind blasts may then have supported the spreading of seeds along the sites. It is not clear if these populations are the result of rinsed-down seeds from sites in – yet to be detected – higher altitudes or if the plants originally have ascended from the gorge (there are also some populations below the road).

The question may arise why this conspicuous *Pinguicula* has not been found earlier in the region. No doubt, the area is rich in deep narrow gorges and steep high mountains not easy to access for lowland tourists. Nevertheless, it was often visited by professional and amateur botanists from Italy and Austria before and especially after the construction of the access-roads around Monte Verzegnis. Maybe the relatively early flowering time of a ‘blue’ *Pinguicula* is one of the possible reasons. POLDINI (1975: 488) e.g. indicates only collections of *Pinguicula vulgaris* in higher regions, flowering end of June to August in the Prealpi Carniche. During

this time *P. poldinii* living in the lower colline zone has faded, the capsules have spread out their seeds and only the intensively brown-red rosettes appressed to the rocky ground can be detected. They can easily be mixed up with those of *P. alpina* which is widespread in this area, even growing in the same stands, descending to altitudes of 500 m or less (POLDINI 1991: 1920, see also POLDINI 1973 for the Friulian plain). The rosette size and the number, shape and colour of the leaves of faded *P. alpina* are indeed quite similar to those of *P. poldinii*.

In a congress contribution on the cool climate species of *Pinguicula* of the northern hemisphere one of us – STEIGER (1998, unpublished) – focussed the attention to the northern and central Italian species. The species in discussion were among other ones *P. reichenbachiana* of the Alpi Marittime, *P. fiorii*, endemism of the Maiella Mountains, by some authors – erroneously – considered to be synonymous with *P. reichenbachiana* Schindler [e.g. CONTI (1998: 158), sub *P. longifolia* DC. subsp. *reichenbachiana* (Schindl.) Casper; TAMMARO & PACE (1987)] and a species from the Appennino Abruzzese hitherto undescribed. He deplored the yet insufficient information about the *Pinguicula* populations indicated especially from the Abruzzi (SCHLAUER 1994; CONTI 1998). In any case *P. poldinii* is distinctly different from the Abruzzi population.

In September 2000 one of the authors (Steiger) visited together with J. Schlauer (Tübingen) numerous *Pinguicula* sites in the SE corner of the Alpi Marittime (Liguria), the Apennino Ligure (Alto Apennino Modenense, border of Toscana/Emilia Romana) and the Alpi Apuane. Of course there were no *Pinguicula* in flower at this time of the year, but in no case any *Pinguicula* rosettes with the typical features of *P. poldinii* could be detected.

In May 1999 one of the authors (J. Steiger, together with J. Schlauer and partly together with the Slovenian colleagues I. Muley and J. Slatner) also visited many *Pinguicula* sites in north-western Slovenia, with a particular focus on searching there for additional sites of the new 'Friuli'-*Pinguicula* which had just been visited in full flower near San Francesco the day before starting the Slovenia excursion. Different sites of (conspicuously dark-flowered) *P. vulgaris* were found and numerous sites of *P. alpina* (descending down to 260 m asl), but no sign at all of any occurrence of *P. poldinii*.

On one hand the new discovery complicates matters with respect to the taxonomy of the genus in the region, on the other hand it seems to promote a better understanding of its evolutionary history. As outlined above the homophyllus *P. poldinii* seems to represent a series by its own (i.e. different from the heterophyllus *Longifoliae*). Consequently, we could give a new name on the series level (e.g. ser. *Prealpicae*) but at present it will be wise to wait for more detailed information on the true nature of the interesting taxon.

Following POLDINI & VIDALI (1999), in the catchment area of the mountain-river D'Arzino the woods are dominated by Austrian pines and are described as *Fraxino orni-Pinetum nigræ* Martin-Bosse 1967. The primary stands of *P. poldinii* belong to the *Adiantion* Br.-Bl. ex Horvatic 1939 with the accompanying species *Eucladium verticillatum*, *Adiantum capillus-veneris*, *Adenostyles glabra*, *Petasites albus*, *P. paradoxus* and elements of the *Caricetalia davallianae* Br.-Bl. 1949, such as *Parnassia palustris* and *Tofieldia calyculata*. Poldini also found *Pinguicula poldinii* in the community of *Schoeno nigricantis-Chrysopogonetum grylli* Pignatti ex Feoli Chiapella et Poldini 1993. Schlauer (letter from January 17, 2000 to J. Casper) mentioned *Paederota lutea*, *Pinguicula alpina* and *Soldanella minima* as accompanying species at the Canale di Cuna-site.

The specific stands, especially the locus classicus Canale di Cuna west of Sella Giâf at about 480 m asl, oreographically and climatically (i.e. physiognomically) remember the localities

colonized by the *Adiantetetea* communities described and denominated *Coeno-Pinguiculion* by DEIL (1989): they are characterized by rock cavities or steep rocks with dripping water ('Felsstirn-Halbhöhlen-Catena'; cf. HEYWOOD 1953; QUEZEL 1968; DIAZ-GONZÁLEZ, GUERRA & NIETO 1982) rich in limestone. The highly endemic, predominantly petrophilus, long-leaved *Pinguicula* species with homophyllus or heterophyllus growth types of the Iberian and Italian peninsulas should be thoroughly investigated as a whole, with respect to the hypothesis that they possibly represent an archaic core of genetic diversification within the sectio *Pinguicula* in the north-western and north-central mediterranean region.

Probably most of these species represent the product of a radiation process primarily on the tetraploid level (CASPER 1966, 1974) combined with hybridization (see the hexaploid *P. dertosensis*) within a relatively restricted clade of the genus traditionally named sectio *Pinguicula*. This phylogenetic process does not include the species of the east-mediterranean *P. crystallina-hirtiflora* complex sensu CASPER (1970; not QUEZEL 1968, not CONTANDRIOPOULOS & QUEZEL 1974), the atlantic *P. lusitanica* L. and the widespread *P. alpina*, all belonging to other evolutionary lines.

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