

With kind regards,
Jost Casper

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Two new *Pinguicula* species (Lentibulariaceae) from East Cuba (Cuba oriental)

On the Caribbean islands the insectivorous genus *Pinguicula* (Lentibulariaceae) is known only from Cuba (five species; ERNST 1961; CASPER 1966; BISSE, LIPPOLD & CASPER 1975, TEMPLE & PANFET VALDES 1998) and the Dominican Republic (Hispaniola; one species; JIMÉNEZ 1960; ERNST 1961; CASPER 1966; ZANONI & GARCÍA 1995).

The following description of two *Pinguicula*-species new to science results from the revision of the Lentibulariaceae for the "Flora de la República de Cuba". The collections were made during the expeditions of the "Proyecto Flora de Cuba" (PFC) between 1966 and 1985.

The new species belong to sect. *Agnata* subsect. *Agnata* (CASPER 1963, 1966; *P. jaraguana*) and sect. *Homophyllum* (CASPER 1963, 1966; *P. infundibuliformis*), respectively.

1. *Pinguicula jaraguana* CASPER, sp. nova – Holotypus: E a s t C u b a (Oriente): Prov. Holguín. Mun. Moa. Arroyo Jaragua [$\sim 74^{\circ}52'W$, $\sim 20^{\circ}25'N$]. 25.02.1979, leg. H. Bisce, L. Lepper, E. Köhler, M.L. Diaz, J. Gutierrez, H. Dietrich, U. Rändel, H. Schaarschmidt, R. Herrera y N. Miklos, PFC 39913 (JE – Isotypus: B, HAJB) – Fig. 1.

Descriptio:

Herba perennis (?) humilis. Rhizoma simplex stoloniferum brevis radicibus adventitiis filiformibus numerosis. Folia (6-) 9-12 (-15), radicalia dense rosulata solum adpressa vel subrecta succulenta (sicco membranacea) (20-) 28-35 (-40) mm longa (8-) 11-12 mm lata integerima oblonga vel subspatulata apice rotundata basin versus in petiolum brevem attenuata plana margine antice paulum involuta laete-viridia (in locis soli expositis saepe rubescens) superne glandulis sessilibus et glandulis stipitatis disperse obsita supra basin nervisequente pilis clavatis obsita. Scapi 1-4 erecti teretes glandulis sessilibus disperse obsiti vel glabriuscui (70-) 110-150 mm alti uniflori. Flores mediocres \sim 15-18 mm longi (calcaro excluso). Calyx distincte bilabiatus glabriuscui vel extus glandulis stipitatis sparse obsitus; labium superum usque ad basin fere trilobum lobis \sim 2-3 mm longis oblongis obtusis (ligulatis) antice paulum truncatis divaricatis; labium inferum bilobum lobis \sim 2-3 mm oblongis segmentis $\frac{3}{5}$ - $\frac{1}{2}$ longitudinis liberis divaricatis. Corolla subisoloba ampliata lobis antice distincte erectis (i.e. a fronte rotato-ampliato \sim 17 mm Ø, ab utroque latere corollae subisoloba) albida extus glabriuscui lobis subaequalibus late-ovatis inter se marginibus basium tegentibus 9-12 mm longis longitudinem

reliqueae corollae valde superantibus basi pitis aurantiacis longis unicarinatis multicellulatis dense vestita. *Tubus* (2,5) 3-4 (-5) mm longus subcylindricus curvatus aurantiacus (superne luteus rubro-striatus), 1,5-2,5 mm latus sine palato, fauce salmonaceus intus ±dense pilosus pilis breviribibus clavatis (Fig. 4d). *Calcar* crassum conicum apice rotundatum (saccatum) cum tubo angustum subrectum (80-90°) distinete formans, 1-2,5 (-3) mm longum, ~1,5-2 mm diametro. *Stamina* ~1,5 mm longae; basi ovarii adnata (into corolla tube inserta); filamenta brevia, incurvata; antherae 2, ~1 mm latae, theca connatis. *Granula* pollinis (zono-) 4-5 corporata. *Ovarium* superum, sessile, uniloculare, subgloboso-ovoidem, ~1,5 mm diametro, in stylum brevissimum protractum; ovula plurima placente liberae sessilia. *Stigma* terminale brevissime inaequilater bilobum lobum inferum fimbriatum, anterius umbelliformiter oblongus. *Capsula* longe ovoidea ~2 mm longa ~1 mm diametro, unilocularis, bivalvata, calycem persistentem superans. Semina scabiformia, brunnea, ~0,5 mm longa ~0,2 mm crassa; testa reticulata.

Habitus *P. albidae* WRIGHT ex GRISBACH et affinibus similis et nullo dubio his specie proxima: praecipue differt foliis oblongis vel spatulatis, corolla subsolsoba (i.e. a fronte rotato-ampliata, ab utroque latere corolla subisloba) lobis longitudinem reliquae corollae valde superantibus, tubo subcylindrico tenui brevissimo, calcar crasso, saccato, cum tubo angulum subrectum (80-90°) formant. *Postito* in systemate generis: *Pinguicula jaraguana* ad subgenus *Isontha* sect. *Agnata* pertinet.

Eymotologia: Adiectivum "jaraguana" a riuulo Jaragua dicta derivatum est.

Icon: fig. 1 holotypus; 2 a habitus, b fls, c folium; 3 a -b habitus, c fls; 4 a-b fls, imago obliqua, c calyx lobi, d pili capitati, e pili multicellulati non capitati, f folium membranaceum venatione campylothrona.

Area distributionis: Cuba oriental, Prov. Holguin, montes Cuchilla de Moa; species endemica insulae Cubae (fig. 8).

Description:

Herb perennial, of low growth, rosette forming, scapose (Fig. 1). *Rhizome* short, with numerous adventitious fibrous roots. *Leaves* (6-)9-12 (15) rosulate lying ± flat on the ground or somewhat erect, succulent (dried membranous), (20-)28-35 (-40) mm long (8-) 11-12 mm broad entire, in outline oblong to spatulate (Figs. 2c, 4f) at the tip rounded to the base very much attenuated into a short petiole with margins vix uprolled, yellowish-green (in open sun-exposed places often turning reddish) blades above sparsely glandular along the nerves above base with clavate hairs. *Scapes* 1(-4), erect, (70-) 110-150 mm tall, terete, about 1 mm thick, 1-flowered (Fig. 2), sparsely glandular. *Flowers* middle-sized, ~15-18 mm long (spur excluded; Fig. 3a-b). *Calyx* distinctly bilabiate, the upper surface sparsely covered with

stipitate glands, shorter than the tube; upper lip divided nearly to the base lobes, the lobes oblong-obuse (rugulose) at the tip rounded rarely slightly, thin 2-3 mm long; lower lip 2 divided to 2-½ into 2 oblong spreading lobes (Fig. 3c), broadly obovate, with its margins overlapping, 9-12 mm long, much less than the rest of the corolla, at bases dense hairy. *Tube* cylindrical, orange slightly curvate back yellowish-red striate, short (2,5-) 3-4 (-5) mm long, 1,5 mm thick (Figs. 2b, 4a-b), without palate; the entrance to the throat dense pilosus long multicellular hairs (Fig. 4e). *Spur* thick conical at the tip rounded (succ. short, 1-2,5 (-3) mm long, 1,5-2 mm Ø with the tube forming a nearly right angle (80-90°; Figs. 2b, 4a-b). *Stamens* ~1,5 mm long, the short filaments slightly incurved. *Anthers* 2, ~1 mm broad, thecae ± confluent roofed by the larger inner lip of the stigma. *Pollen grains* (zono-) 4-5-corporate. *Ovary* subgloboso-ovoide, sessile, ~1,5 mm in diameter, 1-foculate, ending in a short style; central place free, with numerous free sessile ovules. *Stigma* short, bilobed, the lower lobe broad, fringed, the upper lobe much smaller, narrowly oblong, fringed. *Calyx* ovoid ~2 mm long ~1 mm Ø much longer than the persistent calyx. *Seeds* ~0,5 mm long ~0,2 mm thick; testa reticulata.

The new species resembles *P. albida* WRIGHT ex GRISBACH in habit (Figs. 1, 2) and flower colour, but differs sufficiently in the following characters. In *jaraguana* the leaves are oblong to spatulate (Figs. 1, 2c, 4f); in contrast, the leaves of *P. albida* are broad-ovate to suborbiculate. Another striking difference between the two species concerns the corolla. *P. jaraguana* is distinguished by a subsolsobal, not distinctly two-lipped corolla, i.e. the corolla lobes are nearly equal-sized and distinctly differentiated into upper and lower lobes; in the consequence, the corolla when seen from the front appears wheel-shaped (Fig. 3c); the corolla lobes much longer than the rest of the flower (Figs. 2b, 4a-b). In *P. albida* the corolla is distinctly two-lipped. The spur is short, thick, and at top somewhat thinner, blunt rounded (saccate) in *P. jaraguana* forming a nearly right angle with subcylindrical curved thin tube (Figs. 2b, 4a-b). In *P. albida* the spur forming an angle with the tube is somewhat longer, thin, and thickens into a knob-like swelling. The close relationship between the two species is evident.

Distribution: East Cuba, prov. Holguin; endemic to the mountains Cuchilla de Moa (Fig. 8). Growing at the banks in the headwaters of rivulets Jaragua and Jiguan.

Other specimens seen: Prov. Holguin: Moa: Caño Probado, orillas de las cabeceras del río Jiguan [74°50'W., ~20°29'N], 1972/3 de abril, leg. J. Bisev v. R. Berzain PFC 21959 (HAJB, JE [sub 21959a]; specimen mixtum; on the voucher a sec *Pinguicula* named *P. benedicta* BARNETT by the collectors), Moa: Alrededor del Aserrío "La Mellba", 1980/30, de abril, leg. J. Alvarez, R. Berzain, Berzain, H. Dietrich, J. Gutierrez, E. Köhler, A. Llera, L. Lepper, R. Oriello, Panfet, R. Rankin & A.J. Uriquiza PFC 42388 (HAJB, JE, fruiting). M

Ahedectores de la Mina Mercedita cabezadas del río Jiguani. 1985/19 de abr., leg. A. Alvarez & al. PFC 56240 (HAB, JE).

Because of its restricted local occurrence in the mountain region of Moa the epithet of *Pinguicula jaraguana* is derived from the little known rivulet (Spanish arroyo) Jaragua which has its source at the SSE flank of Pico del Toldo and flows into river (Spanish río) Jiguani.

During the campaign in 1968/1969, in December and January, the "plant hunters" collected in the surroundings of the sawmill "La Melba". In his diary and photoprotocol, H. Lippold has mentioned the occurrence of the genus *Pinguicula* without any remark about a white flowering one.

Studying Helga Dietrich's diary of the 1979 campaign, I found a distinct hint on a white flowering *Pinguicula*. On page 59 (25.02.1979) she writes about the collection in the valley of rivulet Jaragua (Spanish arroyo Jaragua): "...am wasserberieselten Hang blühten 100erre Ex. von *P. albida* (Oriente-Typ) und *P. benedicta*, die erste weiß, die zweite rotblühend". [...] ... on the watered slope *P. albida* (Oriente-type) and *P. benedicta* were flowering by hundreds, the first one white, the second one red". It is obvious that *P. albida* (Oriente type) she mentioned is nothing else than our *P. jaraguana*. This becomes evident by the voucher PFC 399/3. On the label H. Dietrich's name among the collectors is cited. Moreover, she took colour photos showing distinctly the species in question (our Fig. 3, black and white photocopy). H. Lepper also member of the expedition took black-and-white-photos from the same individuals.

2. *Pinguicula infundibuliformis* Casper, sp. nova – Holotype: E a s t C u b a (Oriente); Baracoa: altiplano de la Mina Iberia, 600–700 m alto, monte nublado, 1968/ marzo, leg. J. Bisce y E. Küller, PFC 68/5 (JE, cum tab. distrib. – isotypus HAB, cum tab. distrib.) – Fig. 5.

Description:

Herba perennis humilis. Rhizoma simplex breve erectum radicibus adventitiis filiformibus numerosis. Folia (4-) 6-8, radicalia rosulata, rosula ~10-18 (-20) mm diametro, homophylla solum ± adpresso; lamina ambito suborbiculata (raro obovata-obclusa) basin versus in petiolum breve (~6 mm longum) abrupte attenuata, plana margine 0.5-0.75 mm involuta. 5-9 mm longa (sine petiolo), 4-8 mm lata; integerima, (in seco) membranacea, venatione campiodroma, virida, superne glandulis sessilibus et glandulis stipitatis dense obsita. Scapi 1 (-2) erecti teretes piliformes glabriusciliati; (25-) 35-60 (-85) mm alti, uniflori. Flores parvi, (6-) 8-11 (-14) mm longi (calcar brevissimo inclusio). Calyx bilabiatus persistens 5-fidius; exstus glandulis stipitatis sparse obsitus; labium supernum usque ad basin lere trifolium lobis divaricatis apicem versus acutis vel obtusis praemorsis; labium infernum usque ad 1/4 longitudinis bitubum raro frumentatum lobis late obtongis. Corolla subtilabiatu lobis obtongis inter se non tegentes, apice obtusis raro

truncatis, basim versus paucis pilis longis multicellulatis vestitis; labium superbitobum ~6 mm longum brevior quam lobii labii inferi; labium infernum tritobum 9 mm longum lobo medio longiore quam lobii latera. Tubus distinfundibuliformis, 4-5 mm longus, ad flaveum ~5 mm ad basin ~2 mm diam sine palato, in calcar brevissimum ~1(-2) mm longum gradatim transiens calcari subnullo appareat). Stanzia 2. ~4 mm longa; basi ovarii adnata; filum brevia, incurvata; Granula pollinis (zono-) corporata. Ovarium superum, sexunitoculae, subglobosum, in stylum brevissimum productum. Stigma ternae inaequaliter bifidum; lobum infernum antheras umbelliformiter obtusum. Capsula et semina non vidi.

P. benedictae Barnhart affinis, a qua imprimis differt vero statura minore ultra 8 cm, tubo infundibuliformi calcari subnullo, foliis suborbiculatis.

Etymologia: Adiectivum "infundibuliformis" a tubo corollae similiante infundaturum est.

Icon.: Fig. 5 (holotypus), 6 (a habitus, b fls, c folium), 7 (a-b fls, mag oblique, c tubus et calyx, d calyx, e folia rosulata)

Area distributionis: Cuba oriental, Prov. Palenque et Moa; species endemica ins. Cubae (vide Fig. 8).

Description:

Herb perennials, of low growth, rosette forming, scapose. Rhizome short, numerous adventitious fibrous roots. Leaf rosettes to ~10-18 (-20) mm in diam. with few leaves lying ± flat on the ground; homophyllous. Leaves in outline orbicular (Fig. 6c) to suborbicular-broad elliptic, with margins 0.5-0.75 uprolled, 5-9 mm long, 4-8 mm wide, to the base abruptly attenuated into a petiole 4-6 mm long (Fig. 7), Scapes 1(-2), erect, ~(20-) 35-60(-80) mm tall, terete, at 1 mm thick, 1-flowered, sparsely glandular. Flowers small, (6-) 8-10 (-15) mm long (spur included), red-violet (?). Calyx distinctly bilabiate, brownish, covered both the surfaces and the margins with stipitate glands, shorter than the tube; upper lip divided nearly to the base in 3 lobes, the lobes oblong-ovate at the apex acute or obtuse bitten, 3 × as long as wide; lower lip divided to 1/4 longitudinalis, into 2 acute spreading lobes or subtruncate (Fig. 7e). Corolla distinctly two-lipped, violet (?). Lobes and tube striated by veins; upper lip with 2 oblong nearly identical lobes at the apex rounded to subtruncate, 1.5-2 × as long as broad. ~2-4 (-5) long; lower lip somewhat larger than the upper lip, with 3 oblong lobes, the middle lobe much larger than the lateral ones (Figs. 6b, 7a-c), at the apex rounded subtruncate, at the base near the throat with long multicellular uniciliate hairs. Funnel-shaped shorter than the rest of the corolla, ~5-7 mm long (spur included) the entrance to the throat ~3 mm wide, without palea. Spur extremely short, ~2) mm long, regularly straight, i.e. with the tube making no angle but continu-

it without distinct interruption, tapering to the pointed blunt apex (Figs. 6b, 7a-b), very rarely forming an oblique angle with the tube. *Stamens* ~2 mm long, the short filaments slightly incurved. *Anther* thecae ± confluent roofed by the larger fringed lip of the stigma. *Pollen grains* (zono-)porate. *Ovary* subglobose, subsessile, ~1 mm in diameter, 1-loculate, ending in a short style; central placenta free, with numerous free sessile ovules. *Stigma* short, bilobed, the lower lobe broad, fringed, the upper lip much smaller, narrowly oblong, fringed. *Capsule* and *seeds* not seen. – Flotet II-IV (?)

P. infundibuliformis is distinguished from the similar *P. benedita* by its smaller growth in all parts, by the poor-leaved rosette with its ± orbiculate leaves (Figs. 6c, 7f), by the distinct funnel-shaped short tube – from which striking character the species epithet *infundibuliformis* is derived – with its straight extremely short spur (the flower seemingly spur-less; Figs. 6b, 7a-c).

Other specimens seen: Prov. Oriente: Moa: en las orillas del río Jiguani, cerca del segundo aserrío de "La Melba", 1968/fabrit, leg. J. Bisce y E. Köhler, PFC 6758, (JE, sub *P. benedita*).

Distribution and habitat:

P. infundibuliformis is a stenoendemic species known only from two localities in the Prov. Palenque and Moa in eastern Cuba (Fig. 8) where it has been found by H. Bisce and E. Köhler in March and April 1968. From the labels of the herbarium sheets it seems that the plants grow at the banks of small rivers in an altitude of about 600 to 700 m in the cloud-forest zone ("altiplano"; "mone nublado"). They flower during March and April. The species has not been found since though following expeditions led into the direct neighbourhood.

The new species resembles *P. benedita* BARNHART (a species not well known but said to be extremely variable) in habit. In *P. infundibuliformis* the most striking character is the nearly spur-less corolla (Figs. 6b, 7a-c). In contrast, in *P. benedita* a spur is well developed. A close relationship between the two species can be supposed. But the question arises whether *P. infundibuliformis* could be not else than a nearly spur-less mutant. Forms as those make us think of the spur-less *P. norica* BECK from Austria, regarded as a monstrous growth of *P. vulgaris* L. But for reasons not to be discussed at the moment, this is unlikely. It will be better in accordance with our knowledge to rank *P. infundibuliformis* as a species of its own promoting further studies to clarify the nature of the *P. benedita* aggregate.

Abstract

From collections made during the German-Cuban botanical cooperation (Proyecto Flora de Cuba) during 1966 and 1985 two new stenoendemic *Pinguicula* species from the mountain region of eastern Cuba (formerly Prov. Oriente) are described

and figured. *P. jaraguana* Casper sp. nov. (sect. *Agnata*) and *P. infantis-bulifera* Casper sp. nov. (sect. *Homophyllum*). The distribution is mapped.

Zusammenfassung

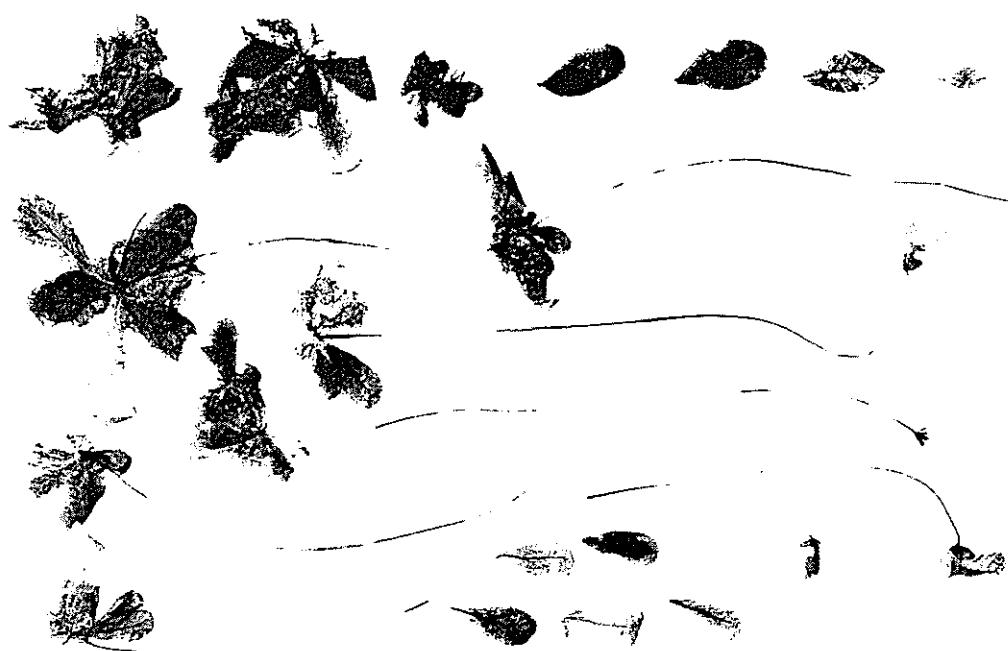
Aus den Gebirgsregionen des östlichen Cuba werden zwei neue stenoendemische *Pinguicula*-Arten beschrieben und abgebildet. *P. jaraguana* Casper sp. nov. (Sect. *Agnata*) und *P. infantis-bulifera* Casper sp. nov. (Sect. *Homophyllum*). Untersuchte Herbariumaterial und die verglichenen Fotos stammen aus den zwischen 1966 und 1985 durchgeführten Expeditionen im Rahmen der deutsch-kubanischen Zusammenarbeit (Proyecto Flora de Cuba). Die Verbreitung ist kartiert.

Acknowledgements

The drawings were made by Mrs. Ilona DOMS, Jena, the photographs were taken by Dr. Helga DIETRICH, Jena. Dr. Helga DIETRICH, Karin LIPPOLD, Dr. Lo LEIPPER, and Dr. Hermann MANITZ, all Jena, made the collection diaries available or gave details about the expeditions in Cuba. Mrs. Rosemary STAMPER assisted in the preparation of drawings and photos for printing. To all of them I am greatly obliged.

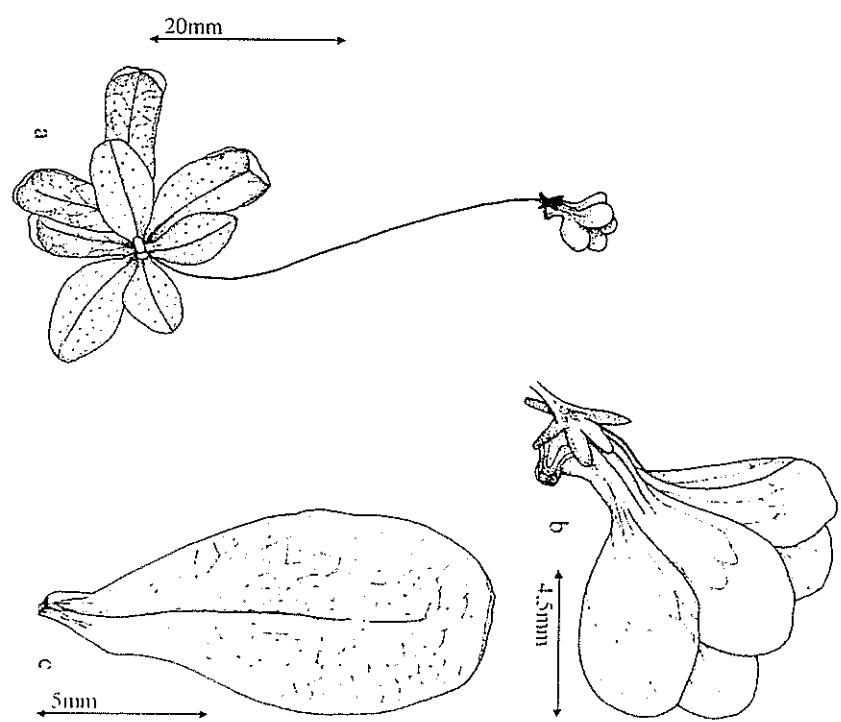
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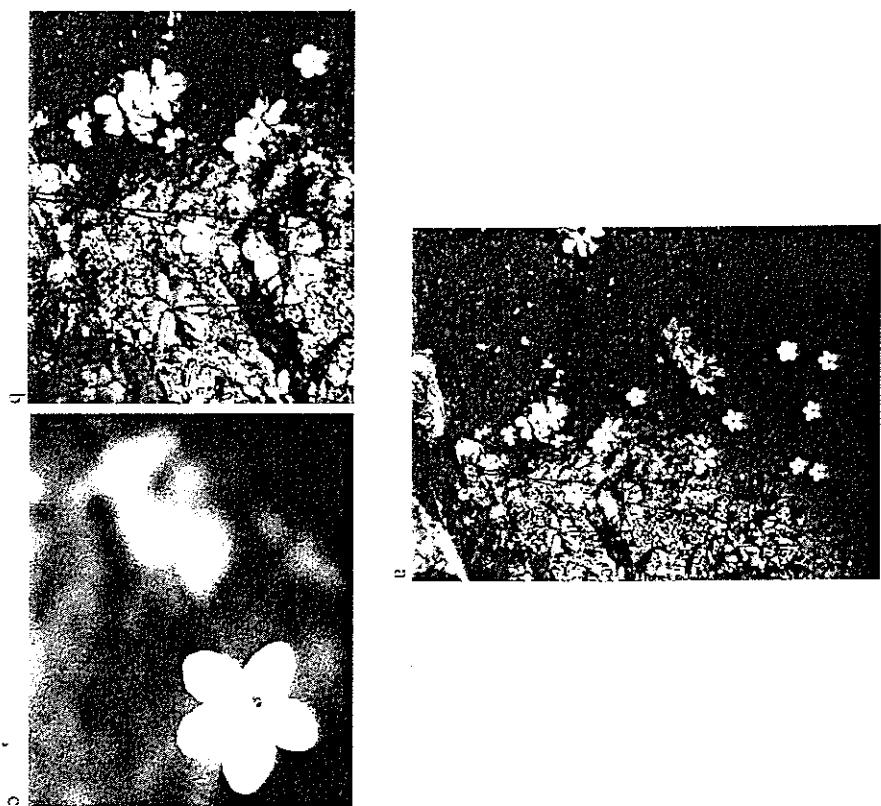
Pinguicula jaraguana CASPER

Fig. 1 *Pinguicula jaraguana*: holotype, photocopy, PFC 39913 - JE.



Pinguicula jaraguana Casper

Fig. 2 *Pinguicula jaraguana*; a habit; b flower; c leaf - Drawings: ILONA DO taken from PFC 39913 - JE.



Pinguicula jaraguana Casper

Fig. 3 *Pinguicula jaraguana*: Cuba: Prov. Holguín, Mun. Moa, Arroyo Jaragua. Details of the locus classicus population: a: habitat; b: detail from a; c: single flower, seen from the front showing the widely open corolla with nearly equal lobes (subisotobe) and the hairy entrance (throat) to the tube. — Photo Helga DRETRICH (79/32, original in colour), 25.02.1979; preparation (scanning, selection of details, black and white version) by Rosemarie STRIMPER and S.J. CASPER.



Pinguicula jaraguana Casper

Fig. 4 *Pinguicula jaraguana*: Microphotos. a-b: flowers, seen from the side, showing the broad, ovate lobes overlapping with their margins, the cylindrical, slightly curved tube, and the short thick blunt spur forming an obtuse angle with the tube; c: oblong-obtuse (ligulate) calyx lobes (isolated); left: lobes of the upper lip; right two: lobes of the lower lip; d: detail of the transition region tube to spur showing headed hairs; e: detail of the corolla lobes base uniseriate manycelled hairs; f: dried leaf with campylosporangia (glands) taken from PFC 39913 (JE), prepared by Rosemarie STRIMPER and S.J. CASPER.

a-b = _____ 5μ
c = _____ 2μ
d = _____ 200μ
e = _____ 50μ
f = _____ 2μ

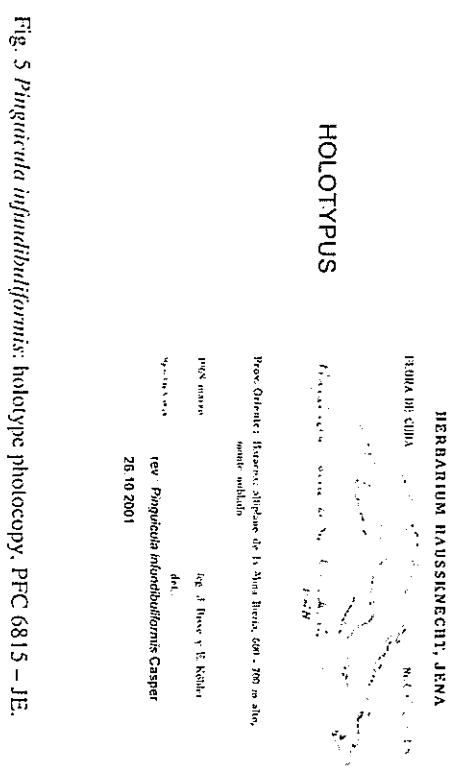


Fig. 5 *Pinguicula infundibuliformis*; holotype photocopy. PFC 6815 – JE.

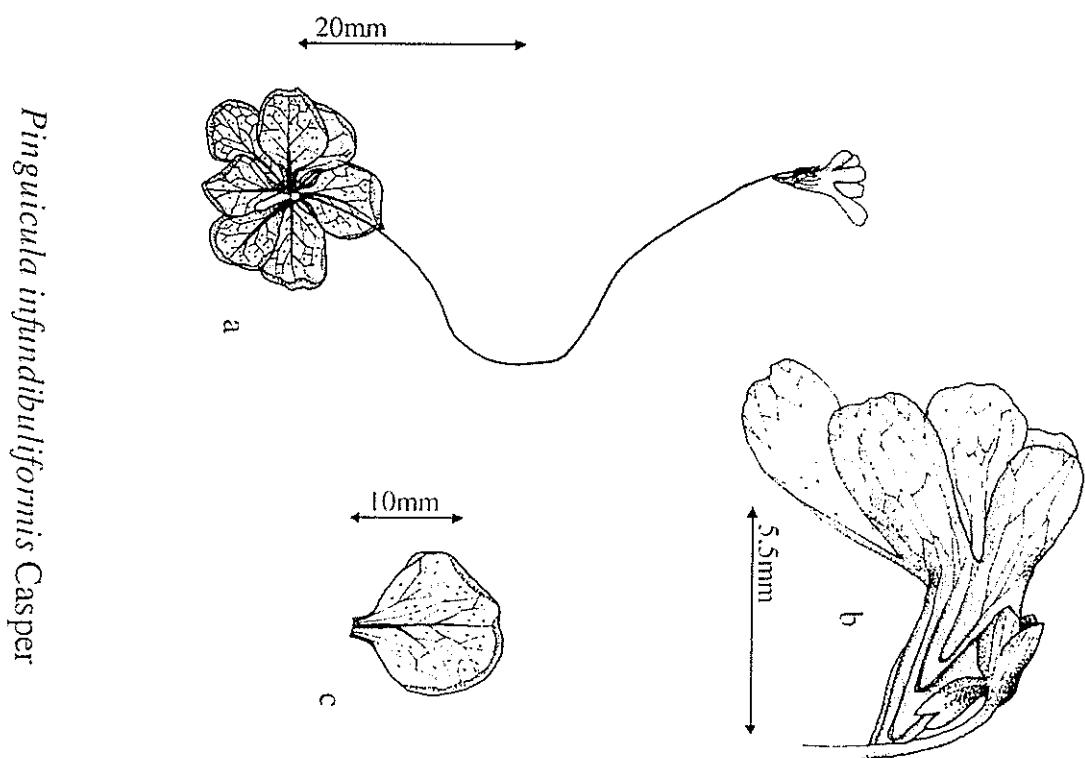
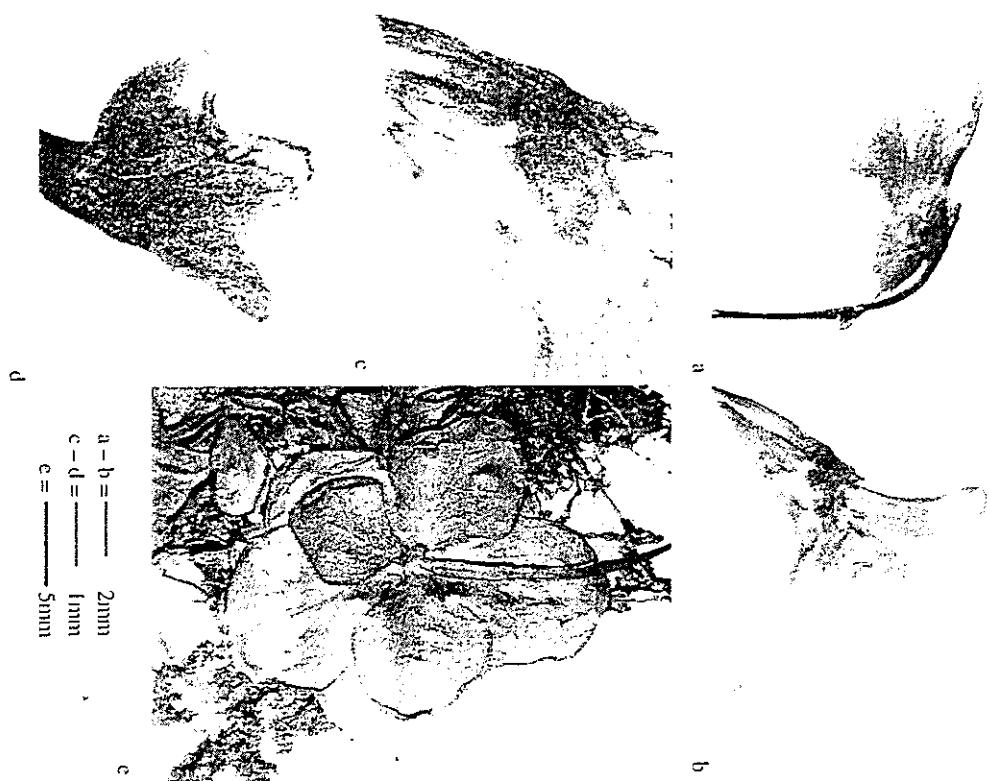


Fig. 6 *Pinguicula infundibuliformis*; a habit; b flower; c leaf. – Drawings. 1¹
DOMS; taken from PFC 6815 – JE.



Pinguicula infundibuliformis Casper

Fig. 7 *Pinguicula infundibuliformis*: Microphotos. a-b flowers, side view; c part of the flower, seen from the back showing funnel-shaped tube and two-lipped calyx; d calyx at maturity, see the deeply divided broadly oblong at the tip bitten upper-lip lobes and the slightly divided lower-lip ones; e leaves of rosette suborbicular, blades at apex somewhat depressed (retuse), at base shortly attenuate, margins weakly involute. — Microphotos taken from PFC 6815 (JE), prepared by Rosemarie STIMPER and S.J. CASPER.

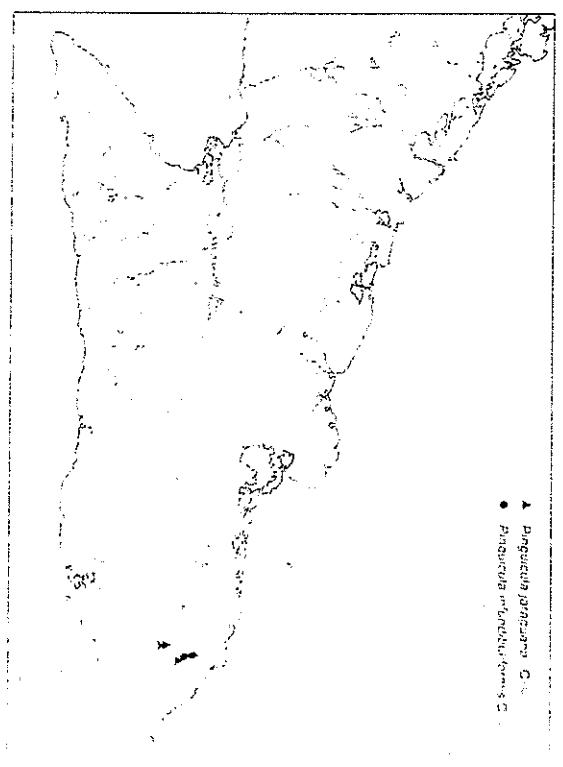


Fig. 8 *Pinguicula jaraguana* and *P. infundibuliformis*, distribution map.

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