

S. JOST CASPER

## 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. Holguin. Mun. Moa. Arroyo Jaragua [ $\sim 74^{\circ}52'W$ ,  $\sim 20^{\circ}25'N$ ]. 25.02.1979, leg. H. Bisse, 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 suberecta succulenta (sicco membranacea) (20-) 28-35 (-40) mm longa (8-) 11-12 mm lata integerrima oblonga vel subspatulata apice rotundata basin versus in petiolum brevem attenuata plana margine antice paulum involuta laete-viridia (in locis soli expositis saepe rubescentia) superne glandulis sessilibus et glandulis stipitatis disperse obsita supra basin nervisequente pilis clavatis obsita. Scapi 1-4 erecti teretes glandulis sessilibus disperse obsiti vel glabriusculi (70-) 110-150 mm alti uniflori. Flores mediocres  $\sim 15$ -18 mm longi (calcarei excluso). Calyx distincte bilabiatu glabriusculus 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  $\frac{2}{3}$ - $\frac{1}{2}$  longitudinis liberis divaricatis. Corolla subisoloba ampliata lobis antice distincte erectis (i.e. a fronte rotato-ampliata  $\sim 17$  mm  $\varnothing$ , ab utroque latere corollae subisoloba) albida extus glabriuscula lobis subaequalibus late-obovatis inter se marginibus basium tegentibus 9-12 mm longis longitudinem

reliquae corollae valde superantibus basi pilis aurantiacis longis uniseriatis 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  $\pm$ dense pilosus pilis brevioribus clavatis (Fig. 4d). Calcar crassum conicum apice rotundatum (saccatum) cum tubo angulum subrectum (80-90°) distincte formans, 1-2,5 (-3) mm longum,  $\sim$ 1,5-2 mm diametro. Stamina  $\sim$ 1,5 mm longa; basi ovarii adnata (imo corollae tubo inserta); filamenta brevia, incurvata; antherae 2,  $\sim$ 1 mm latae, thecis connatis. Granula pollinis (zono-) 4-5 colporata. Ovarium superum, sessile, uniloculare, subgloboso-ovoideum,  $\sim$ 1,5 mm diametro, in stylum brevissimum productum; ovula plurima placentae liberae sessilia. Stigma terminale brevissime inaequaliter bilobum; lobum inferum fimbriatum, antheras umbrelliformiter obtegens. Capsula longe ovoidea  $\sim$ 2 mm longa  $\sim$ 1 mm diametro, unilocularis, bivalvata, calycem persistentem superans. Semina scobiformia, brunnea,  $\sim$ 0,5 mm longa  $\sim$ 0,2 mm crassa; testa reticulata.

Habitu *P. albidae* WRIGHT ex GRISEBACH et affinibus similis et nullo dubio his specie proxima; praecipue differt foliis oblongis vel spatulatis, corolla subisoloba (i.e. a fronte rotato-ampliata, ab utroque latere corollae subisoloba) lobis longitudinem reliquae corollae valde superantibus, tubo subcylindrico tenui brevissimo, calcari crasso, saccato, cum tubo angulum subrectum (80-90°) formanti.

Positio in systemate generis: *Pinguicula jaraguana* ad subgenus *Isoloba* sect. *Agnata* pertinet.

Etymologia: Adiectivum "jaraguana" a rivulo Jaragua dicta derivatum est.

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

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  $\pm$  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,  $\sim$ 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 in 3 lobes, the lobes oblong-obtuse (ligulate) at the tip rounded rarely slightly truncate, 2-3 mm long; lower lip 2 divided to  $\frac{2}{3}$ - $\frac{1}{2}$  into 2 oblong spreading lobes (Fig. 3c). *Corolla* subisolate, whitish, widely open; its lobes erect, with the tube an angle of nearly 90° forming (corolla appearing wheel-shaped when seen from the front; Fig. 3c), broadly obovate, with its margins overlapping, 9-12 mm long, much longer than the rest of the corolla, at bases dense hairy. *Tube* cylindrical, orange (the slightly curvate back yellowish-red striate), short (2.5-) 3-4 (-5) mm long, 1.5-2.5 mm thick (Figs. 2b, 4a-b), without palate; the entrance to the throat dense pilose by long multicellular hairs (Fig. 4e). *Spur* thick conical at the tip rounded (saccate) 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, ~1mm broad, thecae ± confluent roofed by the larger fringed lip of the stigma. *Pollen grains* (zono-) 4-5colporate. *Ovary* subglobose-ovoide, sessile, ~1.5 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* ovoid ~2 mm long ~1 mm Ø much longer than the persistent calyx. *Seeds* ~0.5 mm long ~0.2 mm thick; testa reticulate.

The new species resembles *P. albida* WRIGHT ex GRISEBACH in habit (Figs. 1, 2a) and flower colour, but differs sufficiently in the following characters. In *P. 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 subisolate, not distinctly two-lipped corolla, i.e. the corolla lobes are nearly equal-sized and not 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 are 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 to rounded (saccate) in *P. jaraguana* forming a nearly right angle with the subcylindrical curved thin tube (Figs. 2b, 4a-b). In *P. albida* the spur though 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 Jiguani.

Other specimens seen: Prov. Holguin: Moa: Cayo Probado, orillas de las cabezadas del rio Jiguani [74°50'W, ~20°29'N], 1972/3 de abril, leg. J. Bisse y R. Berasain, PFC 21959 (HAJB, JE [sub 21959a]; *specimen mixtum*: on the voucher a second *Pinguicula* named *P. benedicta* BARNHART by the collectors). Moa: Alrededores del Aserrio "La Melba", 1980/30, de abril, leg. J. Alvarez, R. Berasain, Ch. Beurton, H. Dietrich, J. Gutierrez, E. Köhler, A. Leiva, L. Lepper, R. Oviedo, C. Panfet, R. Rankin & A.J. Urquiola PFC 42388 (HAJB, JE; fruiting). Moa:

Alrededores de la Mina Mercedita cabezadas del río Jiguani, 1985/19 de abril, leg. A. Alvarez & al. PFC 56240 (HAJB, 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 wasserüberrieselten Hang blühten 100erte 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 39913. 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. Bisse y E. Köhler, PFC 6815 (JE, cum tab. distrib. – isotypus HAJB, cum tab. distrib.). – Fig. 5.

Descriptio:

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 ± adpressa; lamina ambitu suborbiculata (raro obovata-obtusa) basin versus in petiolum breve (~6mm longum) abrupte attenuata, plana margine 0,5-0,75 mm involuta, 5-9 mm longa (sine petiolo), 4-8 mm lata; integerrima, (in sicco) membranacea, venatione camptodroma; viridia, superne glandulis sessilibus et glandulis stipitatis dense obsita. *Scapi* 1 (-2) erecti teretes filiformes glabriusculi; (25-) 35-60 (-85) mm alti, uniflori. Flores parvi, (6-) 8-11 (-14) mm longi (calcar brevissimo incluso). Calyx bilabiatus persistens 5-fidus; extus glandulis stipitatis sparse obsitus; labium superum usque ad basin fere trilobum lobis divaricatis apicem versus acutis vel obtusis praemorsis; labium inferum usque ad ¼ longitudinis bilobum raro truncatum lobis late oblongis. Corolla subbilabiata lobis oblongis inter se non tegentes, apice obtusis raro

truncatis, basim versus parce pilis longis multicellulatis vestitis; labium superum bilobum ~6 mm longum brevior quam lobi labii inferi; labium inferum trilobum ~6-9 mm longum lobo medio longiore quam lobi latera. Tubus distincte infundibuliformis, 4-5 mm longus, ad faucem ~5 mm ad basim ~2 mm diametro sine palato, in calcar brevissimum ~1(-2) mm longum gradatim transiens (flos calcari subnullo apparet). Stamina 2, ~1 mm longa; basi ovarii adnata; filamenta brevia, incurvata; Granula pollinis (zono-) colporata. Ovarium superum, sessile, uniloculare, subglobosum, in stylum brevissimum productum. Stigma terminale inaequaliter bilobum; lobum inferum antheras umbrelliformiter obtegentum. Capsula et semina non vidi.

*P. benedictae* BARNHART affinis, a qua imprimis differt vero statura minore, vix ultra 8 cm, tubo infundibiliformi calcari subnullo, foliis suborbiculatis.

Etymologia: Adiectivum "infundibuliformis" a tubo corollae simulate infundibulo derivatum est.

Icon.: Fig. 5 (holotypus), 6 (a habitus, b flos, c folium), 7 (a-b flores, imagines obliquae, c tubus et calyx, d calyx, e folia rosulata)

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

#### Description:

*Herb* perennial, of low growth, rosette forming, scapose. *Rhizome* short, with numerous adventitious fibrous roots. *Leaf rosettes* to ~10-18 (-20) mm in diameter with few leaves lying  $\pm$  flat on the ground; homophyllous. *Leaves* in outline orbiculate (Fig. 6c) to suborbiculate-broad elliptic, with margins 0.5-0.75 mm uprolled, 5-9 mm long, 4-8 mm wide, to the base abruptly attenuated into a petiole 4-6 mm long (Fig. 7f). *Scapes* 1(-2), erect, ~ (20-) 35-60 (-80) mm tall, terete, about 1 mm thick, 1-flowered, sparsely glandular. *Flowers* small, (6-) 8-10 (-15) mm long (spur included), red-violet (?). *Calyx* distinctly bilabiate, brownish, covered on 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 to obtuse bitten, 3  $\times$  as long as wide; lower lip divided to  $\frac{1}{4}$  longitudinis into 2 ovate-acute spreading lobes or subtruncate (Fig. 7e). *Corolla* distinctly two-lipped, red-violet (?), lobes and tube striated by veins; upper lip with 2 oblong nearly identical lobes at the apex rounded to subtruncate, 1.5-2  $\times$  as long as broad, ~ 2-4 (-5) mm 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 to subtruncate, at the base near the throat with long multicellular uniseriate hairs. *Tube* funnel-shaped shorter than the rest of the corolla, ~5-7 mm long (spur included), at the entrance to the throat ~3 mm wide, without palate. *Spur* extremely short, ~ 1(-2) mm long, regularly straight, i.e. with the tube making no angle but continuing

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  $\pm$  confluent roofed by the larger fringed lip of the stigma. *Pollen grains* (zono-) colporate. *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. – Floret II-IV (?).

*P. infundibuliformis* is distinguished from the similar *P. benedicta* by its smaller growth in all parts, by the poor-leaved rosette with its  $\pm$  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 aserrio de “La Melba”, 1968/abril, leg. *J. Bisse* y *E. Köhler*, PFC 6758, (JE; sub *P. benedicta*).

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. Bisse* 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”, “monte 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. benedicta* 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. benedicta* 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. benedicta* 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. infundibuliformis* 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. infundibuliformis* Casper sp. nov. (sect. *Homophyllum*). Das untersuchte Herbarmaterial 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. Lothar LEPPER, and Dr. Hermann MANITZ, all Jena, made the collection diaries available to me or gave details about the expeditions in Cuba. Mrs. Rosemary STIMPER assisted in the preparation of drawings and photos for printing. To all of them I am greatly obliged.

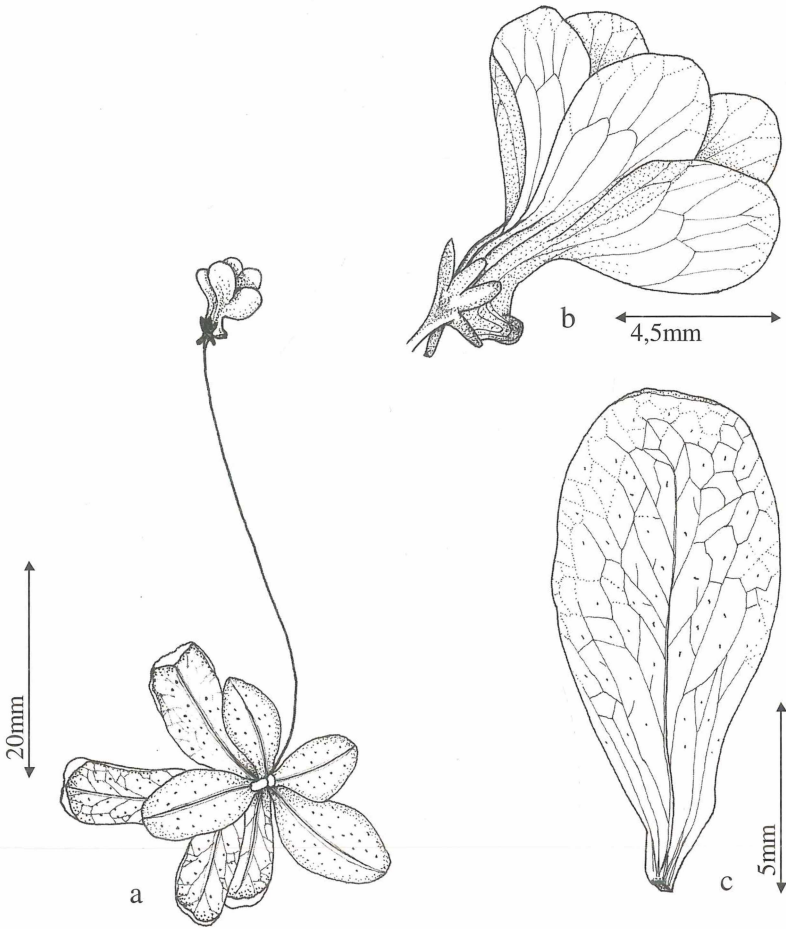
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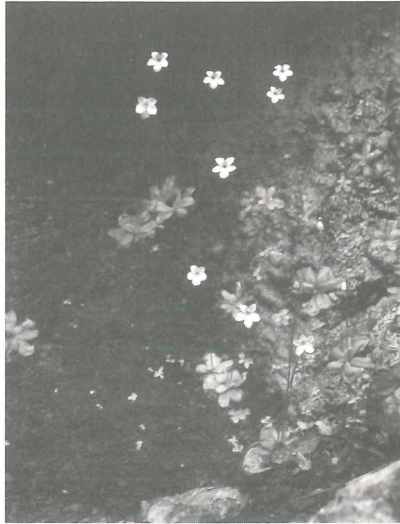
*Pinguicula jaraguana* CASPER





*Pinguicula jaraguana* Casper

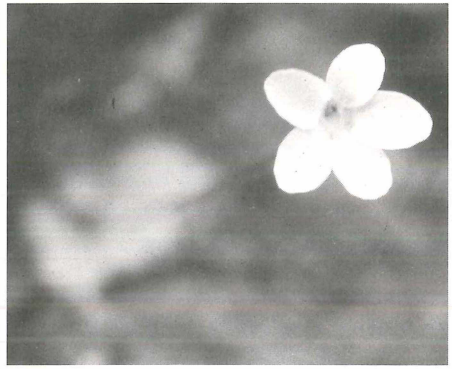
Fig. 2 *Pinguicula jaraguana*: a habit; b flower; c leaf – Drawings: ILONA DOMS; taken from PFC 39913 – JE.



a



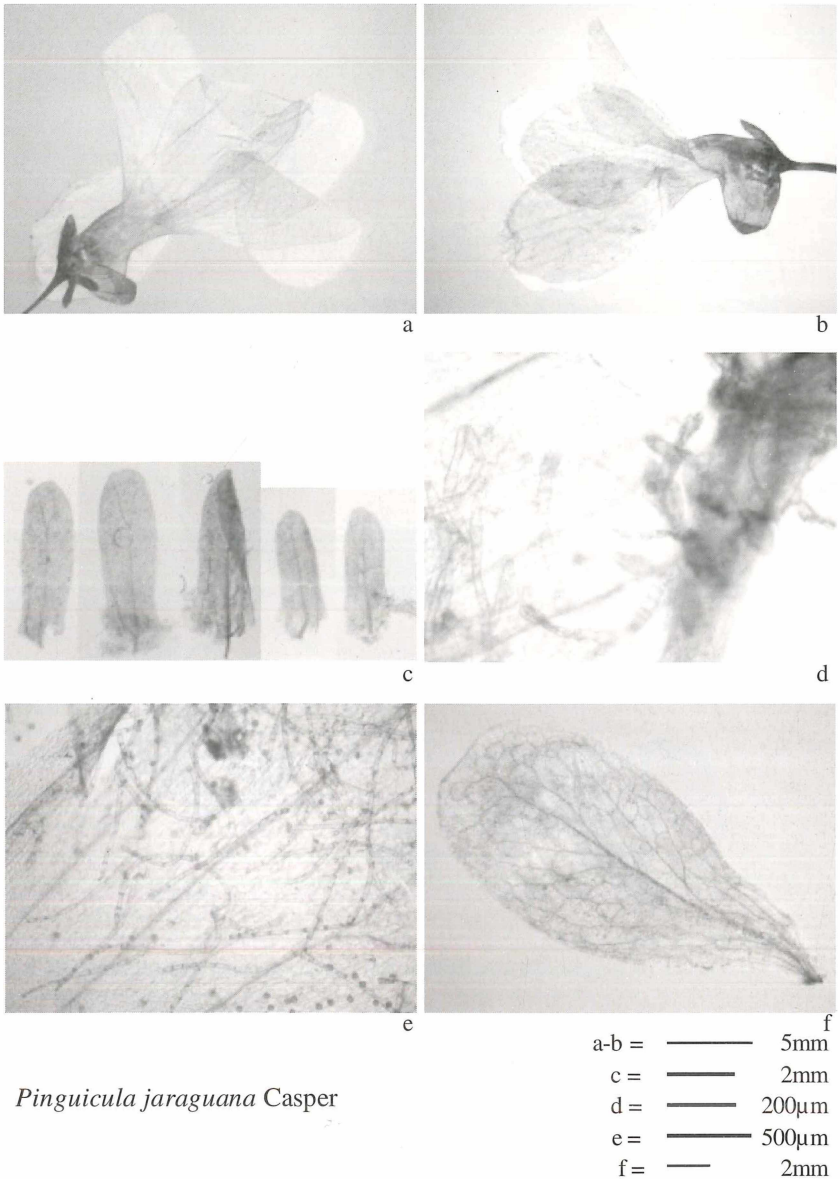
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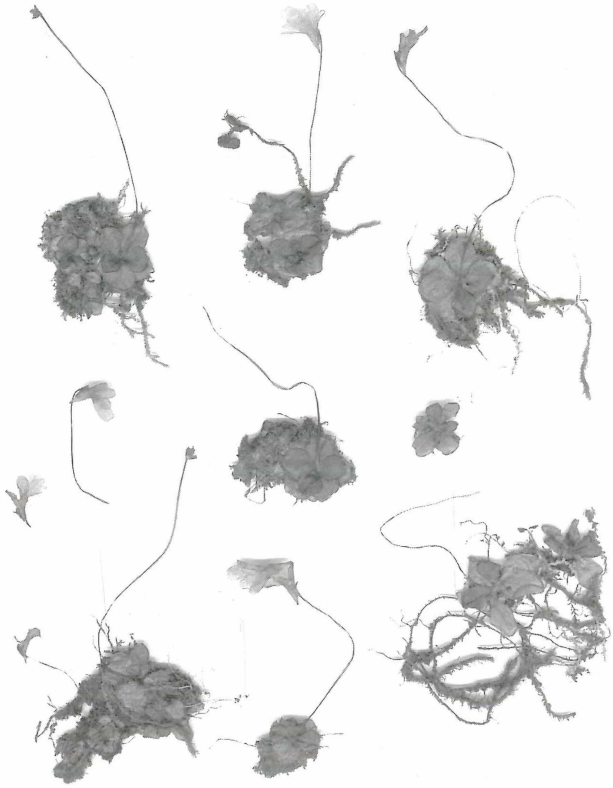
*Pinguicula jaraguana* Casper

Fig. 3 *Pinguicula jaraguana*: Cuba: Prov. Holguin, 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 (subisolate) and the hairy entrance (throat) to the tube. – Photo Helga DIETRICH (79/32, original in colour), 25.02.1979; preparation (scanning, selection of details, black and white version) by Rosemarie STIMPER 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 short, cylindrical, slightly curved tube, and the short thick blunt spur forming an nearly right angle with the tube; c oblong-obtuse (ligulate) calyx lobes (isolated: left three: lobes of the upper lip; right two: lobes of the lower lip); d detail of the transition from tube to spur showing headed hairs; e detail of the corolla lobes base with uniseriate manycelled hairs; f dried leaf with camptodrome vening. – Microphotos taken from PFC 39913 (JE), prepared by Rosemarie STIMPER and S.J. CASPER.



HERBARIUM HAUSSKNECHT, JENA

FLORA DE CUBA

Nr. 006815

HOLOTYPUS

*Pinguicula benediti* Benth. in  
B.H.Prov. Oriente; Baracoa: altiplano de la Mina Iberia, 600 - 700 m alto,  
monte nublado

1968/marzo

leg. J. Bisse y E. Köhler

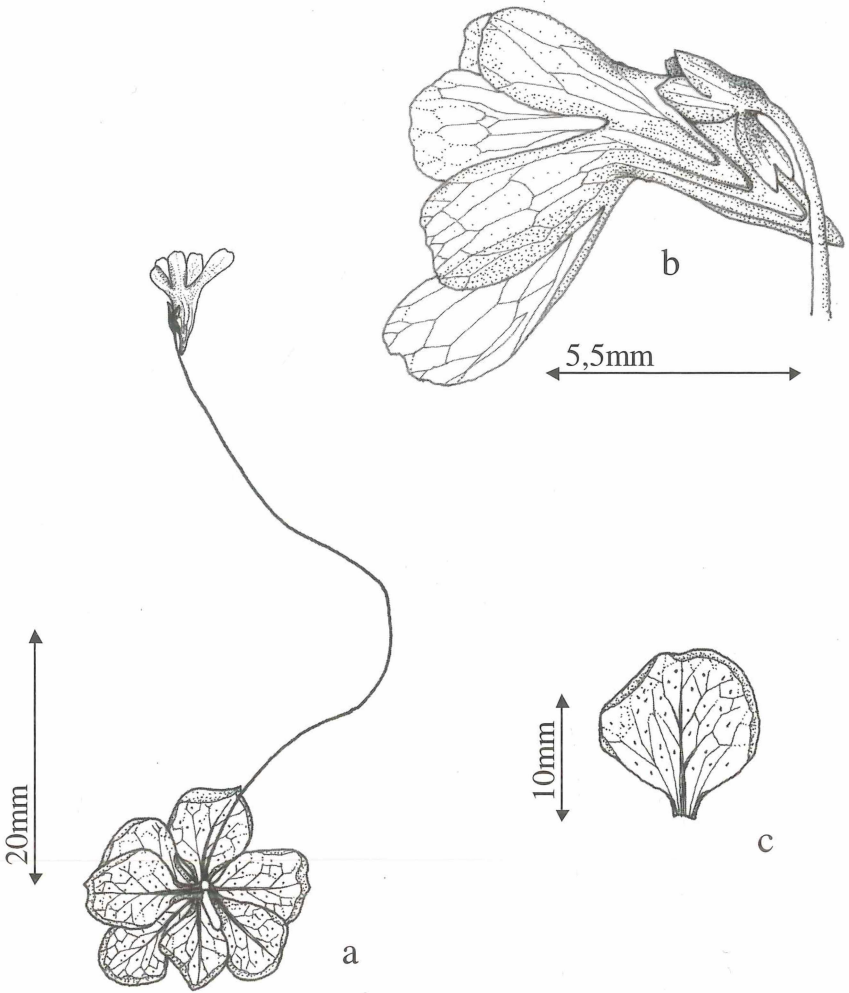
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rev.: *Pinguicula infundibuliformis* Casper

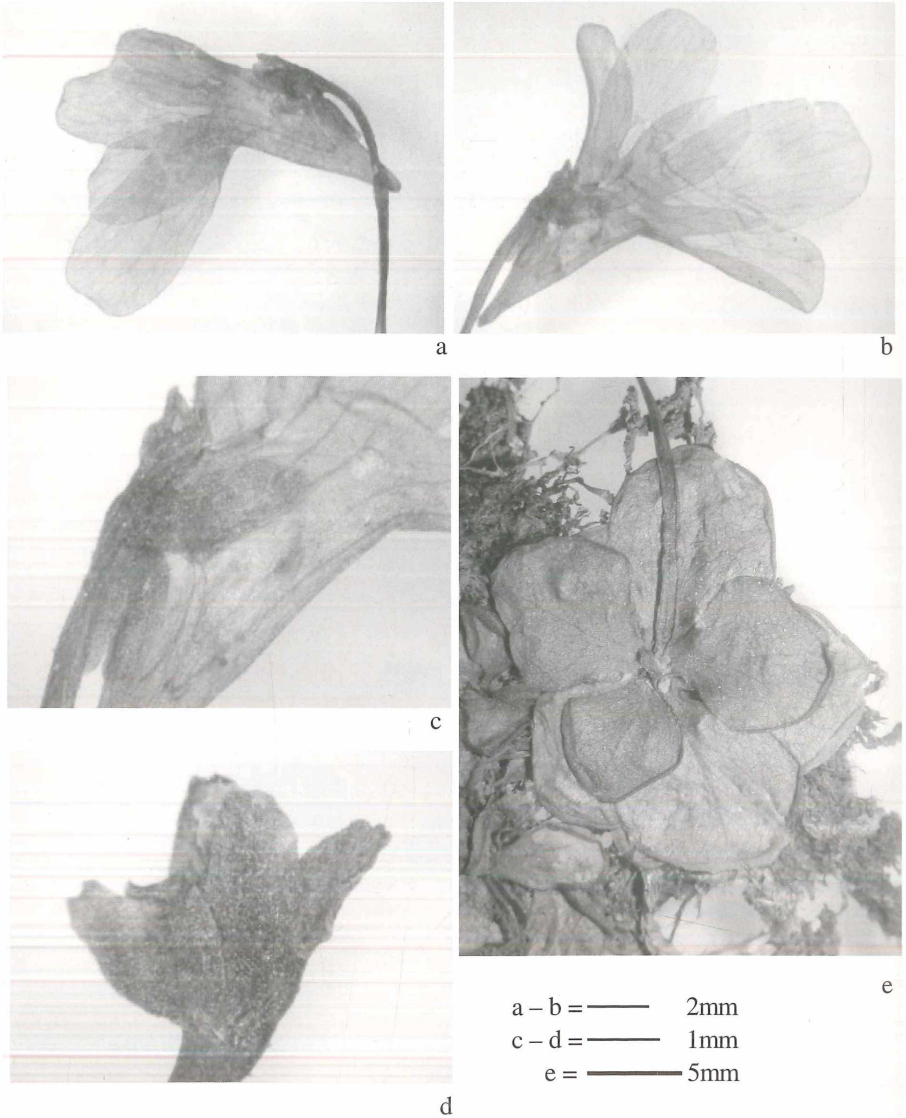
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Fig. 5 *Pinguicula infundibuliformis*: holotype photocopy, PFC 6815 – JE.



*Pinguicula infundibuliformis* Casper

Fig. 6 *Pinguicula infundibuliformis*: a habit; b flower; c leaf. – Drawings: Ilona 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 lobes; 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.



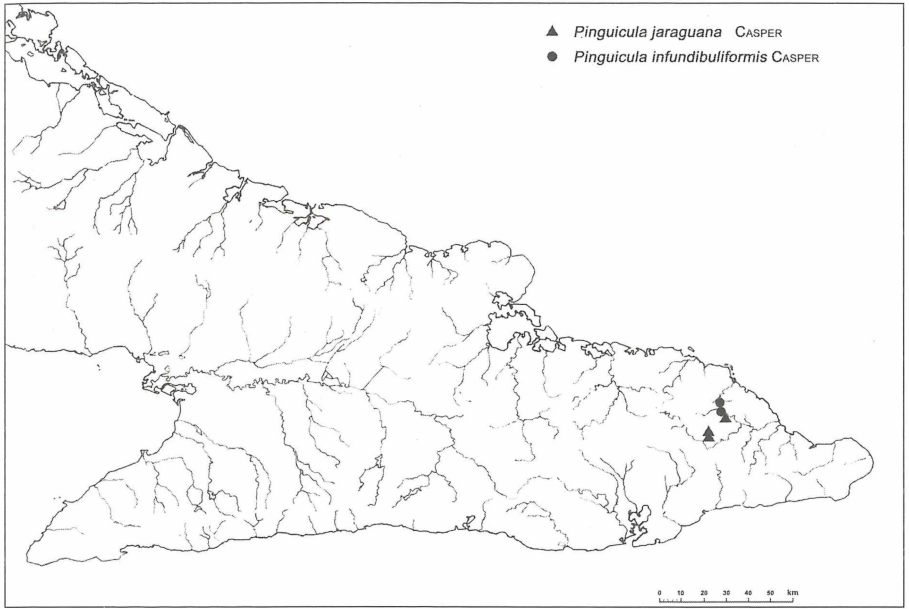


Fig. 8 *Pinguicula jaraguana* and *P. infundibuliformis*, distribution map.

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