

New Species of the Genera *Phtheirospermum* and *Pedicularis*.

BY

GUSTAVE BONATI.

PROFESSOR BAYLEY BALFOUR has kindly entrusted to me the study of numerous species of *Pedicularis* which have arrived at the Herbarium of the Royal Botanic Garden, Edinburgh, since the beginning of the great war. I express to him here as well as to Mr W. W. Smith my deep appreciation of the pleasure which the study of these beautiful plants has given me. The specimens which I have determined come from the collections of Mr George Forrest, Captain Kingdon Ward, Mrs Clemens, Mr Reginald Farrer, Mr C. Schneider, Mr Ridley and from the Reverend Fathers Maire and Monbeig.

Mr Farrer has visited alpine Burma and more particularly the Chimili Valley. His collections contain two new species :—*P. nobilis*, Bonati, *P. multicaulis*, Bonati; in addition two interesting varieties of species already known :—*P. Pantlingii*, Prain, var. *chimiliensis*, Bonati, and *P. siphonantha*, Don, var. *birmanica*, Bonati. This last plant is of great interest for it has the same relationship to *P. siphonantha*, Don that *P. birostris*, Bur. et Franch. bears to *P. cranolopha*, Maxim.

Mrs Clemens has sent only two species of which one is in too poor a state for determination; the second is *P. Tatarinowii*, Maxim., collected in Shansi.

Mr Ridley collected only *P. chinensis*, Maxim., in Kansu. Father Monbeig has sent from the region of Tsekou, *P. tenuisecta*, Franch., *P. verbenaeifolia*, Franch., *P. Monbeigiana*, Bonati, *P. Lipskyana*, Bonati and *P. likiangensis*, Franch. Briefly, nothing new. Father Maire has collected in the region of Tong-chouan quite a series of species of which I give a list at the end of this paper, and among them I mark specially :—*P. dolichantha*, Bonati, *P. praealta*, Bonati, *P. tahaiensis*, Bonati, *P. tongtchouanensis*, Bonati, *P. tachanensis*, Bonati which are new.

Mr Schneider was a member of the Austro-Hungarian Dendrological Expedition which throughout the war was working in the north-east of Yunnan. He has sent to Edinburgh five

species or varieties, two of the latter being new. They are :—*P. densispica*, Franch., var. *Schneideri*, Bonati, *P. cephalantha*, Franch., var. *szetchuanica*, Bonati. Mr Handel-Mazzetti of the Vienna Museum was also a member of this Mission. He wrote me recently that he had collected more than a hundred species of *Pedicularis* in the region of the Chungtien Plateau. But up till now only a very small portion of the collected material has arrived in Europe. He has described recently four new species :—*P. aequibarbis*, Handel-Mazzetti, *P. dolichocymba*, Handel-Mazzetti, *P. parvifolia*, Handel-Mazzetti, *P. pseudo-versicolor*, Handel-Mazzetti, among which his *P. dolichocymba* is my *P. tristiformis*, collected by Captain Kingdon Ward on the Chungtien Plateau as long ago as 1912, but which I had never been able to publish. Mr Handel-Mazzetti has very kindly sent me his diagnosis and some material for study for which I am very much obliged.

The most important collections are the two made by Mr George Forrest and Captain Kingdon Ward. The collection of Mr Forrest contains 78 numbers among which I have found the following new species :—*P. aequibarbis*, Handel-Mazzetti, *P. dolichocymba*, Handel-Mazzetti, *P. humilis*, Bonati, *P. kariensis*, Bonati, *P. cymbalaria*, Bonati, *P. lucifuga*, Bonati, *P. galeata*, Bonati, *P. tribuloides*, Bonati, *P. Handel-Mazzettii*, Bonati, and numerous varieties. The same remarkable collection contains a new species of the genus *Phtheirospermum* :—*P. auratum*, Bonati. I have also met with again in the collection of Mr Forrest many rare species of which the geographical distribution is little known such as :—*P. taliensis*, Bonati, *P. Monbeigiana*, Bonati, *P. Forrestiana*, Bonati, *P. Smithiana*, Bonati, *P. sigmoidea*, Franch., *P. tsekouensis*, Bonati, *P. Viali*, Franch., *P. Bietii*, Franch., *P. pseudo-melampyrisflora*, Bonati, *P. yargongensis*, Bonati, *P. dichotoma*, Bonati, *P. cranolopha*, Maxim., *P. hirtella*, Franch., *P. pseudo-ingens*, Bonati, *P. strobilacea*, Franch., etc., etc.

The collection of Captain Kingdon Ward contains only 40 numbers, but it is equally of great interest. It contains the following new species :—*P. quadrata*, Bonati, *P. praeruptorum*, Bonati, *P. Wardii*, Bonati, *P. lacerata*, Bonati, *P. insignis*, Bonati, *P. atra*, Bonati, *P. pseudo-atra*, Bonati, *P. Reynieri*, Bonati, *P. nobilis*, Bonati, *P. birmanica*, Bonati, *P. laktangensis*, Bonati. Here also we find again many rare species whose distribution is little known such as :—*P. macrosiphon*, Franch., *P. strobilacea*, Franch., *P. dichotoma*, Bonati, *P. taliensis*, Bonati, *P. Duclouxii*, Bonati, *P. dolichocymba*, Handel-Mazzetti, *P. cymbalaria*, Bonati. I describe further on all the new species and varieties. Then I give synoptic tables and indicate the different

series of the genus containing the species described since 1910. Finally I give a list of the species recently collected by the different collectors.

Phtheiospermum auratum, Bonati. Sp. nov.

Planta pluricaulis perennis. Rhizoma breve verticale, radiculis longissimis lineatis vel vix dilatatis tectum. Caules 30-40 cm. alti, tetragonales, erecti, basi simplices ac glabri, decumbentes, ramosi, summo molliter villosi, non glandulosi; ramis gracilibus patulis. Folia opposita, glabra vel paulo villosa, membranacea, nervis inferne eminentibus ac reticulatis, longe petiolata; petiolis basi stricte, alatis ac semi-amplexicaulibus, inferioribus 3-4 cm. longis, superioribus 5-10 mm.; limbo 2-3 cm. longo, 1-4 cm. lato, pinnatisecto, loborum 5-7 jugis; lobis inferioribus petiolulatis, superioribus sessilibus ac petiolo decurrentibus, omnibus profunde pinnatifidis, lobulis obtusis et acutidentatis. Bractee parvae (5-8 mm.) longe petiolulatae, trilobatae, lobis acutidentatis. Flores axillares, oppositi, valde distantes, breviter pedunculati; pedunculis inferioribus 1-2 mm. longis; superioribus subsessilibus, deinde sessilibus. Calyx membranaceus, perlucidus, villosus, costis 5 ac nervis 10 longitudinalibus non reticulatis, infundibuliformis circa 4 mm. longus; dentibus 5 lanceolatis acutis circa 1 mm. longis. Corolla aurea, 10-12 mm. longa, tubo brevissimo lato circa 2 mm. longo; galea paulo villosa, dorso valde curvata, labium inferius multo superante, integra; labio inferiore ciliato circa 5 mm. longo, lobis subaequalibus, medio cucullato integro, lateralibus in media parte profunde incisus margine subulatis. Stamina filamenta glabra, basi inserta; antherarum loculis ovato-oblongis, summo longe subulatis. Capsula ex toto glabra, summo longe attenuata circa 1 cm. longa. Semina comparative magna, 2 mm. longa, ovata basi truncata, testa luteola in longitudine striata obscure reticulata.

"West China :—Open moist shady situations in pine forests on the mountains of the Chungtien Plateau, Yunnan. Lat. 27° 30' N. Alt. 12,000 ft. Plant of 9-16 ins. Flowers deep golden-yellow. July, 1914." G. Forrest. No. 12,873.

The plant is very definitely characterised by its stems glabrous and shining at the base, by its corolla of a fine golden yellow, by its long-petioled leaves, slightly hairy with large lobes, and above all by its seeds relatively very large (2 mm). with a clear yellow wrinkled-alveolar seed-coat. It differs from *Phth. chinense*, Bge., by its relatively small yellow corolla, by its stems glabrous at the base and not glandular; its seeds have coats of the same colour, but are three or four times larger. It differs from *Phth.*

tenuisectum, Bur. et Franch., of which the corolla is also yellow, by its much more developed leaves with large lobes, by its diffuse branches, its glabrous capsules, etc. It differs from *Phth. Parishii*, Hook. f., of which the colour of the corolla is unknown to me, by its larger long-petioled leaves, with broad non-linear lobes, by its larger glabrous capsule, by the seeds seven or eight times the size and by its seed coat being clear yellow and not black. Finally it differs from *Phth. glandulosum*, Benth., which is only imperfectly known to me, by its leaves not being trifid, by its equally lobed calyx, etc.

Phth. Esquirolii, Bonati in *Monde des Plantes* (1907) p. 14 is only a local form peculiar to Kweichow of *Phth. chinense*, Bge.

***Pedicularis humilis*, Bonati. Sp. nov. (Longiflorae).**

Perennis? Radices fusiformes elongatae. Caules multi patuli, repentes, glabrescentes, simplices vel paulo ramosi, 5-15 cm. longi. Folia radicalia longe petiolata, glabra; petiolis strictae alatis basi dilatatis circa 2 mm. longis; limbo circa 15 mm. longo 7-10 mm. lato pinnatisecto, 5-6 jugis loborum ovato-acutorum pinnatilobulorum; lobulis acutis et acutidentatis. Folia caulinarum alterna, raro subopposita, radicalibus similia, sed breviora ac brevius petiolata, lobis linearibus basi arcuatis. Bracteae foliiformes. Flores axillares, pauci, pedunculati, erecti; pedunculis 3-10 mm. longis glabris. Calyx membranaceus, glabrescens, margine ciliatus, 5-6 mm. longus, antice profunde fissus subspathaceus, lobis duobus 1-2 mm. longis basi constrictis ac stipitatis summo palmatisectis; segmentis linearibus acutidentatis, nervis paulo eminentibus summo reticulatis. Corolla rosea; tubo cylindrico villosa 10-25 mm. longo; galea basi contorta pilis glandulosis brevissimis tecta, cum crista paulo eminente; in parte inferiore circa 3 mm. longa; in parte horizontali falciformi lente in apicem sigmoideum 7-8 mm. longum filiformem summo breviter bifidum attenuata; labio inferiore patulo parvo suborbiculari, 9-10 mm. longo, circa 15 mm. lato, superficialiter trilobato; lobo medio profunde bilobato, lateralibus minore; lobis lateralibus emarginatis, omnibus margine dense ciliatis. Stamina ad summum tubi inserta; filamentis duobus villosis. Antherae ovoidae, summo rotundae, loculis obtusis. Capsula ac semina?

"West China :—Shweli-Salween divide. Moist stony pasture. Lat. 25°30'N. Alt. 10,000 ft. Plant of 3-5 ins. Flowers rose. July 1913." G. Forrest. No. 11,969.

The species belongs to the series of the *Longiflorae* in view of its bi-lobed calyx and the elongated corolla tube. Its lower cauline leaves seem to be sometimes opposite. It is akin to *P. armata*,

Maxim., but very different in the calyx; it differs otherwise distinctly from that species in the form of its hood; two staminal filaments alone are hairy in *P. humilis*, Bonati.

Pedicularis dolichantha, Bonati. Sp. nov. (Longiflorae).

Planta perennis. Rhizoma obliquum elongatum, squamis linearibus brevibus et obtusis tectum, radicibus pinguibus elongatis. Unicaulis. Caulis erectus, simplex, 15-30 cm. altus, fistulosus, angulosus, paulo villosus. Folia radicalia caduca. Caulinaria multa, alterna, villosa, petiolata, linearia vel oblonga, pinnatisecta vel profunde pinnatifida; 10-12 jugis loborum ovatorum vel triangulorum acutidentatorum; petiolis 15-40 mm. longis stricte alatis ac margine ciliatis; limbo pingue, 25-60 mm. longo, circa 10 mm. lato; lobis 3-5 mm. longis, basi plus minusve decurrentibus. Bractee foliiformes, petiolulatae, villosissimae. Flores omnes axillares, pedunculati; inferiores valde sparsi; pedunculis gracilibus nigrescentibus erectis glabrescentibus circa 5 mm. longis. Calyx elongatissimus, cylindricus, hirtus, antice profunde fissus circa 12 mm. longus lobis semper duobus basi constrictis breviter petiolulatis profunde palmatifidis, segmentis paucis plus minusve dentatis circa 3-5 mm. longis. Corolla rosea, tubo 30-40 mm. longo extus villosus cylindrico; galea glabra, in parte inferiore breviter basi contorta sicut in *P. siphonantha*, D. Don; in parte anteriore addita crista elongata, abrupte contracta in apicem filiformem sigmoideum circa 10 mm. longum summo haud bifidum; labio inferiore margine ciliato lobo medio cucullato ovato-obtusum non-emarginato, lateralibus multo angustiore. Stamina fauce inserta, filamentis duobus villosis. Capsula ac semina?

Eastern Yunnan:—"Pedicularis annuel, isolé, dressé; fl. rose sombre. Pâturages—haut plateau de Ié-ma-tchouan. Alt. 3,200 m. Août 1913." E. E. Maire. No. 672.

Eastern Yunnan:—"Scrophularinée annuelle. Fl. roses. Lagunes du haut plateau de Ta-hai. Alt. 3,200 m. Juillet 1913." E. E. Maire. No. 688.

The plant is near certain forms (*Hookeriana*) of *P. siphonantha*, D. Don. The differences are:—(1) The hood is furnished with a crest which is prolonged under the base of the beak; (2) the corolla tube is hairy on the outside; (3) the beak is sigmoid not bifid at the point; (4) the lower lip has a non-emarginate median lobe; (5) the calyx has lobes more deeply cut and always two in number. It approaches equally *P. megalantha*, D. Don of which it has the inflorescence and the small flowers. It is distinguished however at a glance by its 2-lobed calyx.

Pedicularis siphonantha, D. Don, var. *birmanica*, Bonati
Var. nov.

This differs from typical *P. siphonantha*, D. Don by its larger corolla with the median lobe of the lower lip more deeply bilobulate and with the tube hairy on the outside, especially at the top. The beak relatively short is deeply bifid and the two lobes are almost perpendicular one to the other as they are in *P. birostris*, Bur. et Franch. All the other characteristics are those of typical *P. siphonantha*—calyx with three teeth, ciliate lip, two hairy filaments, etc. The corolla recalls that of *P. Delavayi*, Franch. In brief, this plant has the same relationship to *P. siphonantha*, D. Don as *P. birostris*, Bur. et Franch. has to *P. cranolopha*, Maxim.

"Upper Burma :—Chimili Valley. Alt. 12,000 ft. Open high alpine meadows and rocks, July, 1919." R. Farrer. No. 1140.

Series Longiflorae.

A. Calyx with five teeth.

Corolla purple; lower lip ciliate on the margin and with the median lobe deeply bilobulate; all the filaments hairy.

1. *P. Delavayi*, Franch.

B. Calyx with two or three teeth.

*Calyx with two teeth. Tube of the corolla hairy; lower lip ciliated on the edges.

+ All the staminal filaments hairy.

△ Calyx with flabellate teeth; beak sigmoid, emarginate at the tip.

2. *P. armata*, Maxim.

△△ Calyx with ovate-oblong teeth; beak horse-shoe shape, entire at the tip.

3. *P. bidentata*, Maxim.

++ Only two staminal filaments hairy.

△ Calyx glabrous, short (5-6 mm.); hood glandular with a crest slightly projecting; lower lip with median lobe bilobulate and with lateral lobes emarginate. A dwarf plant with creeping stems.

4. *P. humilis*, Bonati.

△△ Calyx hairy, elongated (12 mm.); hood glabrous with long prominent crest; lower lip with lobes entire, the median cucullate.

5. *P. dolichantha*, Bonati.

**Calyx with three teeth.

+ Teeth of calyx all incised.

△ Calyx short with sub-equal teeth; tube of the corolla short (10-15 mm.); hood without crest; two filaments glabrous.

6. *P. strobilacea*, Franch.

△△ Calyx much developed with leaf-like lobes; tube of corolla 3-5 cm. long; hood with a crest; all the filaments hairy; lower lip ciliate on the edges.

7. *P. Garnieri*, Bonati.

++Tooth at top of calyx entire.

△Hood with a crest much developed; lower lip glabrous; two filaments hairy; lobes of calyx very large and leaf-like; corolla yellow. . 8. *P. cranolopha*, Maxim.

△△Hood without crest; lower lip ciliate.

±All the staminal filaments hairy.

□Corolla yellow.

†Lower lip with only the median lobe emarginate; beak circinate, entire at the tip.

. 9. *P. chinensis*, Maxim.

††Lower lip with all the lobes emarginate; beak circinate, bifid at the tip.

. 10. *P. longiflora*, Rudolph.

□□Corolla purple.

†Stems tall, upright, branched; flowers very numerous, large, in terminal spikes; beak sigmoid, 1-2 cm. long. 11. *P. sigmoidea*, Franch.

††Stem dwarf (4-5 cm.) generally simple; flowers axillary not numerous; beak falciform 2-3 mm. long, bifid at tip. . 12. *P. latituba*, Bonati.

±±Only two staminal filaments hairy; beak circinate, bifid at the tip. . 13. *P. siphonantha*, D. Don.

Pedicularis insignis, Bonati. Sp. nov. (Macranthae.)

Perennis. Radix crassa, plus minusve ramosa, radiculis linearibus pinguibus elongatis. Caulis simplex, erectus, paulo villosus, paulo foliatus, 15-18 cm. altus. Folia radicalia 8-9 cm. longa, oblonga, villosa, praesertim inferne plus minusve longe petiolata; petiolis alatis 35-50 mm. longis; limbo oblongo obtuso 5-7 cm. longo 15-20 mm. lato, pinnatifido nervo medio eminente; loborum inaequalium 12-13 jugis; lobis inferioribus multo minoribus; omnibus obtusis superficialiter lobulatis; lobulis rotundis obtusis. Folia caulinarum radicalibus similia, sed breviora ac breviter petiolata. Bractae inferiores foliaceae, basi membranaceae ac valde dilatatae; superiores sessiles, ovato-obtusae, integrae vel saepius trifidae, lobo medio spathulato, lateralibus brevissimis ac basi constrictis; omnibus bracteis quam flores brevioribus. Flores in uvis spiciformibus basi valde interruptis; pedunculis gracilibus erectis villosis 10-15 mm. longis. Calyx cylindricus, villosus, 8-12 mm. longus, lobis 5 lanceolato-acutis 4-5 mm. longis; lobo medio lateralibus paulo brevioribus; omnibus incisuris dentibus rotundis; nervis paulo eminentibus reticulatis. Corolla purpurea circa 15 mm. longa; tubo cylindrico summo non dilatato glabro circa 8 mm. longo; galea in parte verticali brevissima, semi-orbiculari tubum aequan-

te, crista valde eminente antice addita ac abrupte in apicem subfiliformem lineatum et semi-orbicularem 3-5 mm. longum contracta margine dente parvo utrinque addito; labio inferiore sessili latissimo margine glabro, lobis 3 paulo profundis subaequalibus rotundis, medio lateralibus minore 2 mm. longo, 5 mm. lato. Stamina fauce inserta; filamentis omnibus in medio villosis, ceterum glabris. Capsula ac semina?

"S.E. Tibet:—Doker-la; 14,000 ft. On screes. Flowers crimson. 1913." F. Kingdon Ward. No. 1105.

This is a very elegant species belonging to Sir D. Prain's series of the "Macranthae." This series at present contains four species easily distinguished by the help of the following key.

Series Macranthae.

A. Lower lip with margin glabrous.

*Calyx not split in front; corolla purple, the tube not exceeding the calyx. Staminal filaments all hairy, inserted on the throat of the corolla; beak not bifid

1. *P. insignis*, Bonati.

**Calyx split in front quite to the middle of its length; beak not bifid; stamens inserted at the middle of the tube.

+ Hood $1\frac{1}{2}$ times as long as the beak, erect at the base; lower lip of the corolla with lobes subequal; corolla rose-coloured or yellow with hood red; all the filaments hairy.

2. *P. macrantha*, Klotsch.

++ Hood three times as long as the beak, subrefracted at the base; lower lip with median lobe $\frac{1}{2}$ as large as the lateral; corolla yellow; filaments hairy.

3. *P. Scullyana*, Prain.

B. Lower lip long-ciliate on the edges. Calyx split nearly to the base; median lobe of lower lip emarginate, half as large as the lateral; corolla purple; all the staminal filaments hairy.

4. *P. Elwesii*, Hook. f.

Pedicularis lacerata, Bonati. Sp. nov. (Longipes).

Radix? Caulis gracilis debilis repens angulosus glaber, 20-35 cm. longus, e basi ramosus, ramis diffusis et oppositis. Folia glabra multa opposita longe petiolata petiolis 6-10 cm. longis patulis non alatis; limbo 5-8 cm. longo, 15-25 mm. lato, ovato-oblongo bipinnatisecto, lobis paucis sparsis petiolulatis 15-30 mm. longis; lobulis linearibus obtusis denticulatis 2-3 mm. longis. Bracteae foliis similes sed brevius petiolatae. Flores omnes axillares oppositi longissime pedunculati, pedunculis 15-30 mm. longis gracilibus flexuosis glabris plus minusve post

anthesin reflexis. Calyx villosissimus ovatus inde campanulatus 5-8 mm. longus; tubo 3 mm. longo membranaceo antice non fisso; nervis 5 primariis ac 10 secundariis non reticulatis; lobis 5 circ. 3-5 mm. longis basi subfiliformibus, summo stricte lanceolato-acutis ac breviter lobulatis. Corolla purpurea; tubo recto cylindrico glabro calycem paulo superante circa 8 mm. longo intus villosus; galea glabra, in parte inferiore tubum recte sequente ac aequante; in parte horizontale falciformi, circa 5 mm. longa et in apicem rectum integrum 3-5 mm. longum finita; labio inferiore patulo superius aequante superficialiter trilobato margine ciliato; lobis ovato-obtusis, medio lateralibus minore. Stamina ad trientem infimum tubi inserta, omnia undique villosissima. Capsula glabra, ovato-orbicularis, in spinam obliquam circa 2 mm. longam supra attenuata, calycem paulo superans. Semina?

"West China:—A-tun-tsu. Alt. 13,000 ft. In damp shade in forest and shrub belt. August 1913." F. Kingdon Ward. No. 935.

A plant allied to *P. axillaris*, Franch., from which its main differences are:—(1) the form of the leaves, (2) the hairy calyx, (3) all the staminal filaments hairy to the base. Its capsule is equally as remarkable as and resembles those of *P. Souliei*, Franch. and *P. Petitmengini*, Bonati. Unfortunately we have no certain and authentic specimens of the capsule of *P. axillaris*, Franch. It is equally near to *P. heterophylla*, Bonati, collected in 1913 by Rev. Père Soulié in the forests of Yargong, a region relatively near to A-tun-tsu; the leaves and the hairy calyx are similar in the two plants but *P. lacerata*, Bonati has:—(1) the lower lip ciliate on the edges, (2) the staminal filaments all hairy to the base, (3) the lower lip with the middle lobe smaller than the lateral.

***Pedicularis tribuloides*, Bonati. Sp. nov. (Longipes).**

Perennis. Rhizoma horizontale. Radices crassae fusiformes elongatae. Caules multi diffusi repentes ramosi villosi lanati cinerei cylindrici, 10-20 cm. longi. Folia radicalia caduca. Folia caulinarum inferiora et media opposita, petiolata ovato-oblonga pinnatisecta, 6-8 jugis segmentorum alternorum oblongorum basi ac summo attenuatorum sessilium; petiolis 6-12 mm. longis stricte alatis; limbo 25-30 mm. longo, 10-15 mm. lato; lobis 6-8 mm. longis, 2-4 mm. latis. Folia superiora inferioribus similia, sed breviora ac subsessilia. Flores omnes axillares, pedunculis 5-7 mm. longis erectis ac lanatis. Calyx villosus cylindricus aut globulosus, 7-8 mm. longus, non antice

fissus nervis 10 non anastomosantibus, lobis 5 aequalibus vel paulum inaequalibus, circiter 2 mm. longis, basi constrictis ac stipitatis, ovato-acutis, summo profunde incisus acutidenticulatis. Corolla rosea; tubo longissimo, usque ad 4-5 cm. longo in totius incrementi tempore, glabro cylindrico summo vix dilatato; galea glabra, in inferiore parte erecta, 4-5 mm. longa, in horizontali parte vix curvata, 5-6 mm. longa, in rostrum conicum ac rectum circiter 2 mm. longum lente attenuata, non cristata. Labium inferius basi cordiforme, 10-12 mm. longum, superius paulo superans, margine glabro, superficialiter trilobatum, lobo medio laterales paulo superante parvo (2.5-3 mm.) cucullato. Stamina fauce inserta, filamentis glabris, antheris cordiformibus summo et oculis apiculatis. Capsula ac semina?

"West China :—Salween Valley. Margins of thickets, by streams. Lat. 28° 10' N. Alt. 10,000 ft. Plant of 6-10 ins. Flowers rose. June 1917." G. Forrest. No. 16,207.

This species belongs to the *Axillares* and to the series *Longipes*. Its corolla as also that of the following species is almost exactly like that of *P. macrosiphon*, Maxim., but the calyx has five teeth all similar and incised, and the elongated diffuse stems bear opposite leaves at their base. It differs from *P. laxiflora*, Franch. in the form of its leaves and in their disposition. They are alternate at the summit of the stems and opposite at the base, while they are alternate at the base in *P. laxiflora*, Franch. The corolla is also very different. Finally *P. tribuloides* is densely covered with greyish woolly hairs which give it a peculiar ashy colour.

***Pedicularis lucifuga*, Bonati. Sp. nov. (*Longipes*).**

Planta, primo adspectu, *P. tribuloidi*, Bonati valde affinis. Tamen ab illa differt :—(1) caulibus angulosis longioribus, 30-40 cm. vel ultra longis, ramosis villosissimis, (2) foliis longius petiolatis longioribus minus carnosus; (foliorum inferiorum lobis saepe petiolulatis, sicut in *P. laxiflora*, Franch.); petiolis 10-30 mm. longis; limbo 50-60 mm. longo ac circa 20 mm. lato; 8-10 jugis loborum 10 mm. longorum ac circa 5 mm. latorum, (3) pedunculis longioribus (10 mm.) gracilioribus flexuosis diffusis, (4) calyce circa 10 mm. longo, lobis subfiliformibus, summo vix dilatatis ac incisus.

Corollae forma est eadem, et tubus pariter elongatus, sed labium inferius margine ciliatum est, et lobus medius est linearis, oblongus ac multo longior. Bina staminum filamenta glabra, bina altera villosa. Capsula ovoidea calycem non superans, apice 1-1.5 mm. longo latere dextro ejecto.

"S.E. Tibet:—On Ka-gwr-pw, Mekong-Salween divide. Shady pasture on the margins of pine forests. Lat. 28° 25' N. Alt. 10,000 ft. Plant of 9-16 ins. Flowers rose, beak darkest. July 1917." G. Forrest. No. 14,200.

The group *Longipes* at present contains 11 species which can be classified as follows:

Series *Longipes*.

- A. Tube of the corolla very long, 4 to 5 times as long as the calyx.
 - a. Lower lip ciliate on the edges.
 - *Staminal filaments glabrous; tube of the corolla hairy on the exterior; leaves bipinnatisect, segments linear $\pm$ sub-filiform; beak very long.
 1. *P. batangensis*, Bur. et Franch.
 - **Two staminal filaments hairy; tube of the corolla glabrous; leaves pinnatisect, with lobes broadly oval and often petiolulate; beak conical, very short.
 2. *P. lucifuga*, Bonati.
 - b. Lower lip glabrous on the edges.
 - *Lower leaves very large, 10-12 cm.; plant glabrous or glabrescent; tube of the corolla hairy; beak long.
 3. *P. Omeiana*, Bonati.
 - **All the leaves approximately of the same size; plant covered with woolly hairs and having an ashy appearance; tube of the corolla glabrous; beak short, similar to that of *P. macrosiphon*.
 4. *P. tribuloides*, Bonati.
- B. Tube of the corolla short, at most $1\frac{1}{2}$ -2 times as long as the calyx.
 - a. Lower cauline leaves alternate, those of the branches opposite; staminal filaments glabrous.
 5. *P. laxiflora*, Franch.
 - b. Leaves all opposite.
 - *Staminal filaments all glabrous.
 - + Calyx with lateral teeth flabellate; the middle tooth lanceolate; leaves with broad segments petiolulate; peduncles equalling the leaves. 6. *P. filicifolia*, Hemsl.
 - + + Calyx with teeth all alike.
 - Δ Peduncles short, scarcely exceeding the length of the calyx; leaves with segments broad and petiolulate.
 7. *P. nasturtiifolia*, Franch.
 - $\Delta\Delta$ Peduncles long.
 - $\pm$ Teeth of calyx flabellate.
 - $\square$ Peduncles 4-5 times as long as the calyx, corolla yellow; leaves bipinnatisect.

8. *P. Balfouriana*, Bonati.
 □□ Peduncles $1\frac{1}{2}$ –2 times as long as the calyx, corolla purple. 9. *P. axillaris*, Franch.
 ± ± Teeth of calyx lanceolate, entire or very slightly incised. 10. *P. longipes*, Maxim.
 **At least two staminal filaments hairy.
 + Two filaments hairy; lower lip glabrous, beak short. 11. *P. heterophylla*, Bonati
 + + All the filaments hairy; lower lip ciliate on the edges; beak long. 12. *P. lacerata*, Bonati.

***Pedicularis tahaiensis*, Bonati. Sp. nov. (Oliganthae).**

Planta annua? (*Maire*). Radix? Caules basi glabri, summo plus minusve villosi, simplices, flexuosi, 15–30 cm. alti. Folia radicalia? Folia caulinarum pauca, alterna, quandoque quasi opposita, glabra, longe petiolata, pinnatisecta, 8–10 jugis loborum oblongorum vel linearium acutorum profunde pinnatifidorum; lobis triangularibus acutis mucronulatis; petiolis inferioribus 6–12 mm. longis superioribus fere nullis; limbo ovato, 15–20 mm. longo, circa 10 mm. lato; segmentis inferioribus brevissimis (circa 2 mm.) sparsissimis quandoque breviter petiolulatis; segmentis mediis 3–6 mm. longis, 1–2 mm. latis. Bractae foliiformes sessiles, pinnatisectae floribus breviores. Flores sessiles, inferiores axillares sparsissimi superiores in spicis terminalibus paucifloris. Calyx villosissimus albidus trichomis elongatis dense tectus 5–7 mm. longus, antice fissus, dentibus duobus constrictis ac basi petiolulatis summo flabellatis profunde acutidenticulatis 1–1.5 mm. longis. Corolla rosea, circa 20 mm. longa, tubo cylindrico recto extus villosissimo intus glabro erecto calycem longe superante, 12–16 mm. longo; galea glabra, in parte inferiore erecta, 5–6 mm. longa, in parte horizontali 4–5 mm. longa, recta, cum crista magna addita et abrupte contracta in apicem filiformem decumbentem rectum vel paulo arcuatum circa 4 mm. longum summo profunde bifidum, fauce marginis inferioris dentibus duobus acutis ac retrorsis addita (quod est ad basin galeae); labio inferiore superius aequante, margine glabro, lobo medio lateralibus longiore ac angustiore. Stamina filamentis duobus villosis. Capsula ac semina?

Eastern Yunnan :—"Pedicularis annuel; fl. roses. Pâturages, plateau de Ta-hai. Alt. 3,200 m. Juillet 1913." E. E. Maire. No. 678.

A plant easily recognisable in the series of the *Oliganthae* by the form of its leaves and by the tube of its corolla densely covered with long trichomes.

Pedicularis laktangensis, Bonati. Sp. nov. (Oliganthae).

Rhizoma horizontale, breve, squamis lanceolato-linearibus 15–20 mm. longis tectum, quae e basi desiccato petiolorum oriri videntur. Radices fusiformes elongatissimae 8–10 cm. longae, radiculis filiformibus. Caulis simplex erectus basi glaber summo villosus cylindricus fistulosus, 25–30 cm. altus, paulo foliosus. Folia radicalia glabra, multa, longe petiolata; petiolis 30–45 mm. longis planis ac striete alatis; limbo 8–12 cm. longo, 20–30 mm. lato, bipinnatifido; 12–15 jugorum lobis alternis basi decurrentibus profunde incis, lobulis acutidentatis ac mucronatis. Folia caulinarum rara (4–6) radicalibus similia, sed minus profunde secta sessilia. Flores axillares pedunculati singuli ac basi sparsi, summo in uvam spiciformem multifloram valde densam erectam conferti, pedunculis erectis filiformibus 2–3 mm. longis villosis. Calyx 6–7 mm. longus glabrescens membranaceus antice profunde in spatham fissus, dentibus 3 inaequalibus, dente summo breviori subulato integro lateralibus basi constrictis apice flabellatis 2–3 mm. longis quandoque apice bilobulatis. Corolla albo-rosea; tubo 7–8 mm. longo cylindrico summo non dilatato extus villosus ac intus ad insertionem staminum; galea non cristata glabra, in parte verticali erecta, 3–4 mm. longa, tubum recte sequente, in parte anteriore obtusangulatim curvata et erecta, 3–4 mm. longa et abrupte contracta in apicem falciformem lineatum 7–8 mm. longum plus minusve erectum; labio inferiore obscure trilobato, lobis ovato-obtusis longe ac dense margine ciliatis, medio breviori ac cucullato a latere compresso basi subcordato. Stamina ad summum ovarii inserta; filamentis omnibus glabris. Capsula ovata, glabra, 10–12 mm. longa, breviter apiculata. Semina ovata, paulo summo attenuata, in longitudine valde striata summo ac basi reticulata, circa 3 mm. longa, 1–2 mm. lata.

“Upper Burma:—Laktang. On steep grassy slopes facing south, often with No. 3253. Also on the granite ridge beneath bamboos on the more open saddles. Lat. 26° 10' N. Long. 98° E. Alt. 9–10,000 ft. Visited by bees. Flowers pale pink, the horn darker, stems pale green without any red in it as in No. 3253. June 1919.” F. Kingdon Ward. No. 3293.

Pedicularis quadrata, Bonati. Sp. nov. (Oliganthae).

Perennis. Rhizoma horizontale crassum, squamis ovatis acutis tectum; radiculis crassis lineatis elongatis. Caules breves 12–15 cm. alti simplices cylindrici villosi erecti paulo foliosi. Folia alterna; radicalia multa villosa cinerea crassa; petiolis

circa 2 cm. longis stricte alatis; limbo 30-35 mm. longo lineato-lanceolato basi attenuato profunde pinnatifido raro pinnatisecto; 10-12 jugis loborum; lobis oblongis pinnatilobulatis; lobulis obtusis. Bractee inferiores foliiformes petiolatae; superiores ovatae petiolatae integrae vel vix incisae calycem aequantes vel superantes. Flores in uva terminali 5-7 cm. longa basi interrupta summo plus minusve compacta; flores inferiores longe pedunculati; pedunculis erectis filiformibus villosis circa 1 cm. longis; flores superiores subsessiles. Calyx cylindricus griseus trichomis tectus circa 1 cm. longus usque ad medium antice fissus crassus; lobis 5 subaequalibus 2-3 mm. longis omnibus obscure lobulatis. Corolla purpurea; tubo calycem aequante cylindrico paulo arcuato glabro; galea paulo villosa falcata (crista valde proeminente ac elongatissima) abrupte contracta in apicem filiformem semiorbicularem vel sigmoideum, galeam aequantem, in margine inferiore bidentata; labio inferiore superius aequante margine glabro superficialiter trilobato, lobis subaequalibus. Stamina ad basin tubi corollae inserta; filamentis 2 villosis in parte inferiore et media. Capsula et semina?

"S.E. Tibet:—Precipicès, alpine turf, etc., Ka-gwr-pw. Alt. 15,500 ft. July 1913." F. Kingdon Ward. No. 812. (Mixed with *P. Elwesii*, Hook f. and *P. praeruptorum*, Bonati.)

A plant having some affinities with the species of the series of *Robustae* of Prain in view of the staminal insertion towards the lower third of the tube of the corolla. It is separated however from all the species of this group by its hood furnished with a very developed crest and its beak not bifid. It has also affinities with the group of the *Oxycarpae*, among which its nearest relative appears to be *P. tibetica*, Franch. It differs from the latter by its robust appearance, its flowers with long upright peduncles and by its larger corolla whose tube does not exceed the calyx. Its true position appears to be in the group of the *Oliganthae* of Prain.

Pedicularis tachanensis, Bonati. Sp. nov. (*Oliganthae*).

Rhizoma verticale breve. Radices fusiformes elongatae simplicès. Caules ascendentes simplices basi glabri plus minusve dense pilis fuscis summo tecti paulo foliosi. Folia radicalia multa longissime petiolata; petiolis 3-6 cm. longis basi dilatatis ac anguste alatis paulo villosis raro glabrescentibus; limbo lineato-lanceolato obtuso 4-6 cm. longo circa 1 cm. lato pinnatisecto; 15-20 jugis loborum ovato-oblongorum sessilium; lobis ovato-oblongis profunde pinnatifidis 4-6 cm. longis 28-35 mm. latis, lobulis acutidentatis. Folia caulinarum radicalibus similia sed brevius petiolata lobis stricte linearibus simpliciter dentatis;

petiolis basi dilatatis ac margine pilis fuscis ciliatis. Bractee floribus breviores; inferiores foliiformes, breviter petiolatae, lobis subfiliformibus; superiores pinnatilobatae, lobis obtusis. Flores in uvis terminalibus spiciformibus dispositi, pedunculis 2-3 mm. longis erectis. Calyx membranaceus circa 6 mm. longus; tubo cylindrico antice fisso lobis 2 basi filiformibus summo flabellatis circa 1 mm. longis. Corolla rosea circa 2 cm. longa; tubo cylindrico recto calycem hemiolum superante extus glabro intus ad staminum insertionem villosa; galea in parte inferiore saepius retroversa circa 1 cm. longa rectangulatim curvata; in parte horizontali 6-7 mm. longa valde proeminenter cristata; crista dorso villosa et in apicem filiformem 5 mm. longum finita; margine dente uno, latere quoque refracto; labio inferiore superius paulo superante haud profunde trilobato margine ciliato. Stamina ad trientem tubi corollae inserta; filamentis omnibus glabris. Capsula glabra 10-15 mm. longa breviter mucronata. Semina ovoidea apiculata 2 mm. longa, circa 1 mm. lata in longitudine ad faciem ventralem striata.

East Yunnan:—"Marécages du plateau de Ta-chan. Alt. 2200 m. Pedicularis vivace; fl. roses. Août 1914." E. E. Maire. No. 182.

Pedicularis strobilacea, Franch., var. *riparia*, Bonati.
Var. nov.

Planta primo conspectu *P. strobilaceae*, Franch. similis. Annua vel biennis. Radix cum palo verticali cylindrico; radiculis filiformibus. Caulis erectus e basi ramosus in maxima parte glaber summo pubescens, ramis flexuosis non ramificatis caulem aequantibus. Folia inferiora quandoque opposita, superiora omnia alterna; omnia longissime petiolata; petiolis patulis stricte alatis 15-25 mm. longis; limbo paulo villosa ovato-oblongo 2-3 cm. longo, circa 15 mm. lato, profunde pinnatifido vel saepius pinnatisecto; 3-7 jugis loborum pinnatilobulorum; lobulis integris obtusis acutidentatis. Bractee foliiformes sed sessiles ac basi membranaceae cuneatae. Flores subsessiles, summo caulium ac ramorum glomerati in uvis spiciformibus brevibus densis, sicut apud *P. strobilaceam*, Franch., *P. cephalantham*, Franch., etc.; pedunculis circa 1 mm. longis. Calyx membranaceus 8-10 mm. longus antice fissus usque ad trientem; dentibus 5 foliaceis sessilibus flabellatis 1 mm. longis profunde lobulatis; lobulis ovato-obtusis mucronatis; tubi nervis 5 reticulatis. Corolla luteola; galea rubra; tubo calycem aequante cylindrico lato extus villosa; galea erecta, in parte verticali brevi (circa 5 mm.) dorso falciformi rugoso circa 6 mm. longo cristato abrupte in apicem filiformem erectum vel paulo curvatum 6 mm.

longum contracto; labio inferiore superius aequante orbiculari margine ciliato haud profunde trilobato, lobo medio lateralibus multo minore obtuso 3 mm. longo ac lato. Stamina filamenta fauce inserta, quorum duo dense villosa. Capsula ac semina?

"West China :—N.W. Yunnan. By streams in forest. Alt. 10–11,000 ft. July 1913." F. Kingdon Ward. No. 683.

"Mekong-Salween divide, Yunnan, in alpine meadows. Lat. 28° 12' N. Alt. 13,000 ft. Plant of 9–12 ins. Flowers white or pale rose, beak deep crimson. July 1917." G. Forrest. Nos. 14,367, 14,581.

A plant similar to *P. strobilacea*, Franch., to which I have attached it as a variety, and whose position appears to be doubtful in spite of its having the stamens inserted on the throat. It differs from *P. strobilacea*, Franch. by its 5-toothed calyx, short corolla tube and the beak straight or scarcely arched and much longer; there are no teeth on the lower edge of the hood. If the figure given by Maximowicz is correct it is easy to distinguish at a glance var. *riparia*, Bonati from *P. strobilacea*, Franch. In var. *riparia* two staminal filaments are densely hairy, the two others are less so, but they are not glabrous; the hood has a very different shape in the two plants.

Pedicularis cephalantha, Franch., var. *szetchuanica*, Bonati.
Var. nov.

Differs from the type by :—

The stems shaggy with hairs red at the tips; the leaves with petioles relatively longer and with the lobes broader (10–12 pairs of lobes 8 mm. long, 4–5 mm. broad); the membranous bracts dilated and long-ciliated at the base; the calyx invariably with two teeth lanceolate-acute pinnatilobate with lobes obtuse and not numerous and with tube membranous and yellowish, deeply cleft in front, 7–8 mm. long; the tube of the corolla 13–14 mm. long; the hood not hairy on the back, but simply glandular less abruptly contracted into a beak about 5 mm. long, slightly bifid at the extremity. As in the type two of the staminal filaments are hairy and the lower lip is glabrous.

West China :—"Szetchuen austr. inter Hunka et Woloho in pratis. Alt. 3000 m. Jun. 1915." Camillo Schneider; Iter chinense, 1914, societatis dendrologicae Austriae et Hungariae. No. 1516.

"Inter Woloho et Humati in pratis mont. Alt. 2800 m. Jun. 1915." C. Schneider. No. 3763.

By the form of its calyx the above plant approaches *P. oligantha*, Franch. and *P. longepetiolata*, Franch. but *P. oligantha*, Franch. has the lower lip ciliate and the staminal filaments all

glabrous and *P. longepetiolata*, Franch. has the lobes of the calyx deeply divided, the stem very long and very leafy, etc. Dr Handel-Mazzetti who took part in the Austro-Hungarian expedition and who lived for four years in Western China has called my attention to the fact that the lower edge of the hood of *P. cephalantha*, Franch. shows a tooth only on one side; I have myself often noted the same fact, but I have been able to convince myself that it is not absolutely constant.

Series Oliganthae.

- A. Staminal filaments all glabrous.
 - Lower lip with ciliate edges; calyx with three teeth, that on the top entire 1. *P. oligantha*, Franch.
- B. At least two staminal filaments hairy.
 - *Staminal filaments all hairy.
 - + Lower lip glabrous.
 - Inflorescence a long raceme; calyx with 5 flabellate, more or less incised teeth; stem long, weak, hairy, woolly at the top 2. *P. Margaritae*, Bonati.
 - ++ Lower lip ciliate on the edges.
 - △ Hood with a crest.
 - + Flowers arranged in short spike-like racemes; calyx with two teeth; plant small, erect, with few leaves, glabrescent, at least at the base. Corolla rose. 3. *P. tachanensis*, Bonati.
 - ± ± Plant weak. Corolla yellow. Calyx with five lobes. 4. *P. pseudocephalantha*, Bonati.
 - △△ Hood without crest, on anterior side erect or ascending; inflorescence in long racemes, calyx with 3 lobes. 5. *P. laktangensis*, Bonati.
 - **Two staminal filaments hairy.
 - + Lower lip with edge glabrous.
 - △ Hood with a crest.
 - + Calyx with five lobes, all obtusely lobulate; median lobe of the lower lip of the corolla dilated; leaves all alternate, fleshy; plant hairy, of ashy appearance. 6. *P. quadrata*, Bonati.
 - ± ± Calyx very hairy, with two teeth deeply incised. Tube of the corolla very hairy. 7. *P. tahaiensis*, Bonati.
 - △△ Hood without crest.
 - ± Hood hairy on the back sharply contracted into the long beak; calyx with five teeth of which two are subulate and entire, the other three lanceolate and serrate; lower leaves opposite.

ad tubi basim inserta, filamentis omnibus villosis. *Antherae summo truncatae, loculis abrupte ac breviter apiculatis.

"West China :—Open, moist stony pasture on the Kari Pass, Mekong-Yangtze divide. Lat. 27°40'N. Alt. 13,000 ft. Plant of 2-3 ins. Flowers deep rose. August 1914." G. Forrest. No. 13,070.

A plant allied to *P. Stadlmanniana*, Bonati, but more robust, with much larger corolla, with tube much longer than the calyx and with hood glabrous on the back; the peduncles are much shorter and the lobes of the calyx recall those of the calyx of *P. batangensis*, Bur. et Franch.

Series Polyphyllatae. (*Sensu stricto*).

A. Lower lip glabrous; hood glabrous; calyx not split in front but with five equal flabellate sessile or subsessile teeth; filaments all hairy. . . . 1. *P. gruina*, Franch.

B. Lower lip more or less densely ciliate on the edges; calyx more or less deeply cut in front.

*Teeth of calyx dissimilar, that at the top entire, lanceolate, acute, subfiliform, the latter ones stipitate, dilated at the top, pinnatisect; staminal filaments all hairy. Hood glabrous. Peduncles very short. . . . 2. *P. kariensis* Bonati.

**Teeth of the calyx all similar incised. Hood hairy on back.

+ Lobes of calyx triangular, acute, stipitate, peduncles long, up to 20 mm.; plant with slender stem and diffuse branches. . . . 3. *P. Stadlmanniana*, Bonati.

+ + Lobes of calyx flabellate, sessile or subsessile, plant robust.

△ Peduncles very long, spread out or reflexed, 20-35 mm. long, shaggy. . . . 4. *P. polyphylloides*, Bonati.

△△ Peduncles short not exceeding 5-10 mm. erect. . . . 5. *P. polyphylla*, Franch.

Pedicularis birmanica, Bonati. Sp. nov. (Pectinatae).

Rhizoma verticale fusiforme elongatum; radiculis filiformibus plus minusve ramosis. Caulis circa 15 cm. altus ramosissimus, ramis ascendentibus vel patulis, summo villosus basi glabrescens angulosus erectus vel plus minusve flexuosus. Folia sessilia basi truncata, inferiora opposita, superiora 3-verticillata, omnia ovato-oblonga, 20-30 mm. longa, 7-10 mm. lata, pinnatifida, 4-5 jugis segmentorum lineato-obtusorum et obtuse denticulorum. Bractae sessiles, foliiformes, sed basi membranaceae. Flores sessiles, inferiores axillares sparsi, superiores summo caulium in spicis densibus brevibus conicis conjuncti. Calyx villosus

campanulatus, circa 8 mm. longus, dentibus 5 longis 2 mm.; lente summo integro lanceolato-acuto; lateralibus basi constrictis late dilatatis ac summo obscure lobatis margine ciliatis; tubo membranaceo perlucido, nervis 10 non reticulatis. Corolla purpureo-splendens, circa 20 mm. longa; tubo cylindrico glabro circa 12 mm. longo, recto, calyce duplo longiore; galea non cristata, tubo duplo brevior, in parte verticali 3 mm. longa, dorso rotundo, in parte horizontali 3 mm. longa, abrupte contracta in apicem 8-10 mm. longum rectum vel paulo arcuatum; labio inferiore apicem aequante margine ciliato, lobo medio obtuso concavo brevi lateralibus paulo longiore. Stamina medio tubi inserta; filamentis omnibus glabris. Capsula ac semina?

"Upper Burma:—Paijawn Bum. On open meadows facing grassy slopes at the summit. Lat. $26^{\circ}10'N$. Long. $98^{\circ}30'E$. Alt. 12-13,000 ft. Flowers bright crimson. July 1919." F. Kingdon Ward. No. 3441.

A plant belonging to the series *Pectinatae* and nearly allied by its floral characters to *P. ramosissima*, Bonati. It differs from this species by its hood having no crest and by its corolla tube twice as long as the calyx. Moreover its leaves are sessile and verticillate in threes.

***Pedicularis praealta*, Bonati. Sp. nov. (Pectinatae).**

Planta valde affinis *P. alopecuros*, Franch., a qua differt:—(1) caulibus robustis erectis 1 m. altis, summo plus minusve ramosis, paulo villosis vel glabrescentibus; (2) foliis omnibus longe petiolatis, generaliter 4-verticillatis; petiolis 10-15 mm. longis; limbo pingui inferne villosissimo praesertim ad nervos, 30-40 mm. longo, ovato-oblongo, summo attenuato, profunde pinnatifido, 7-10 jugis lorum lanceolato-obtusorum; (3) inflorescentia in spicis longioribus (5-12 cm.) minus densis ac basi plus minusve interruptis; (4) bracteis non imbricatis, calycem non superantibus, superioribus basi attenuatis ac membranaceis; (5) calyce villosissimo, lobis 5 aequalibus ac omnibus profunde acutidentatis ovato-oblongis obtusis circa 1 mm. longis; tubi calycini nervis primariis 10 summo reticulatis; (6) tubo corollae calycem duplo superante, intus ad insertionem staminum villosus; galea simili *P. alopecuros*, Franch. sed apice brevior ac falci-formi 4-5 mm. longo; labio inferiore quam superius brevior glabro; staminum filamentis glabris; antherarum loculamentis obtusis; capsula calycem paulo superante ovoidea apiculata, apice breviter ac paulo lateraliter ejecto, 8 mm. longa, 5 mm. lata, glabra; seminibus paucis circ. 8, ovoideis in longitudine striatis ac tenuissime reticulatis, circa 2 mm. longis ac 1 mm. latis.

Eastern Yunnan:—"Plateau herbeux de Ié-ma-tchouan. Alt.

3,200 m. *Pedicularis annuel*, haut. 1 m.; fl. jaunes. Août." E. E. Maire. No. 673.

Pedicularis dichotoma, Bonati, var. *Wardiana*, Bonati. Var. nov.

Differs from the type described in 1908 (Bull. Soc. Bot. Fr. lv, 247) :—(1) by the calyx split in front to a third of its length; (2) by the lobes of the calyx being shorter and not exceeding the fourth or fifth of the length of the tube; (3) by the hood sharply contracted into the long and linear beak; (4) by the lower lip of the corolla having its edge glabrous or with very few hairs.

N.W. Yunnan :—A-tun-tsu. Alt. 11-13,000 ft. Aug. 1913. F. Kingdon Ward. Nos. 950, 1070.

Series Pectinatae.

A. Calyx with teeth all entire.

*Staminal filaments all hairy.

+ Lower lip glabrous.

△ Tube of the corolla equalling the calyx. Stamens inserted at the base of the corolla tube and in an enlargement of it in the form of a sack.

± Corolla rose; flowers arranged in an interrupted spike.

1. *P. pectinata*, Wall.

± ± Corolla yellow; flowers arranged in dense not interrupted spikes.

2. *P. tenuirostris*, Benth.

△△ Tube of the corolla $1\frac{1}{2}$ times as long as the calyx; stamens inserted at the middle of the tube.

3. *P. pyramidata*, Royle.

++ Lower lip ciliate, corolla purple, beak straight; leaves fleshy, pinnatisect, similar to those of *P. striata*, Pall.

4. *P. dichotoma*, Bonati.

**At least two staminal filaments glabrous.

+ Two filaments glabrous; corolla yellow with hood red, lower lip with margin ciliate.

5. *P. Duclouxii*, Bonati.

++ Staminal filaments all glabrous; lower lip ciliate, corolla purple.

6. *P. pectinatifomis*, Bonati.

B. Calyx with teeth incised, or at least with lateral teeth incised.

*Tooth at top of calyx entire.

+ Lower lip of the corolla with ciliate margin.

△ Hood with a crest; tube of the corolla not exceeding the calyx; flowers small.

7. *P. ramosissima*, Bonati.

△△ Hood without a crest.

± Corolla large 20 mm. with tube twice as long as the

- calyx, about 10 mm.; lower part of the hood very short; leaves sessile verticillate in threes.
8. *P. birmanica*, Bonati.
- ± ± Calyx very small 2-2½ mm.; lower part of the hood as long as the tube; leaves with long petioles.
9. *P. atuntsiensis*, Bonati.
- + + Lower lip of the corolla glabrous.
- △ Hood with a crest. Lower lip shorter than the upper; lateral teeth of the calyx little divided.
10. *P. Fetisowii*, Regel.
- △△ Hood without crest; lower lip as long as the beak; lateral teeth of the calyx deeply incised; beak straight.
- ± Stem slender; leaves membranous with long petioles verticillate in fours; lower part of the hood as long as the tube.
11. *P. Smithiana*, Bonati.
- ± ± Stem robust; leaves fleshy, subsessile, usually opposite; lower part of the hood very short, almost none.
12. *P. alopecuro*, Franch.
- **Teeth of calyx all incised.
- Lower lip shorter than the upper; tube of the corolla twice as long as the calyx, beak falciform.
13. *P. praealta*, Bonati.

Pedicularis Handel-Mazzettii, Bonati. Sp. nov. (Debiles).

Perennis. Rhizoma verticale squamis nonnullis linearibus obtusis tectum. Radices fusiformes aut lineares, paulo ramosae. Caules multi erecti vel adscendentes angulosi in sulcis lanati alibi glabri non ramosi, 5-9 cm. alti. Folia radicalia caduca. Caulinaria pauca glabrescentia; inferiora petiolata ovata oblonga profunde pinnatipartita, lobis 5-7 ovatis obtusis acutidentatis; petiolis 5-6 mm. longis; limbo 7-8 mm. longo, circa 4 mm. lato, lobis 2-3 mm. longis, circa 1 mm. latis. Folia caulinarum media subsessilia vel sessilia, basi membranacea, 5-6 mm. longa, 3-4 mm. lata, ovato-obtusata acutidentata. Bractae membranaceae basi dilatatae summo foliaceae ac palmatilobatae. Flores subsessiles, summo caulis in racemis spiciformibus spissis ac brevibus conjuncti. Calyx brevis, 5-6 mm. longus, membranaceus, in nervis et in marginibus villosus, vesiculosus, costis 5 eminentibus et lobis 5; summo lobo integro lanceolato-acuto; lobis lateralibus flabellatis ac profunde incisis. Corolla rosea; tubo cylindrico recto circiter 10 mm. longo summo villosa; galea in parte inferiore tubum aequante ac erecta; in parte superiore recto angulo geniculata et in rostrum filiforme 5-6 mm. longum rectum vel vix arcuatum obscure attenuata; labio inferiore rostrum aequante, in marginibus spisse ciliato, lobo medio minimo ac laterales vix

superante. Stamina filamenta omnia villosa, ad summum corollae tubi inserta. Antherae summo truncatae loculamentis obtusis. Capsula paulum calycem superans longe apiculata. Semina parva circa 1.5 mm. longa cinerea arcuata apiculata valde reticulata.

"West China :—Stony, moist pasture on the mountains of the Chungtien Plateau, Yunnan. Lat. 27°55'N. Alt. 12,000 ft. Plant of 2-3 ins. Flowers rose. August 1913." G. Forrest. No. 10,776.

A plant allied to *P. verbenaeifolia*, Franch. and especially to the variety *minor* of this species (Maximowicz, Diag. Pl. Nov. Asiat. vii, p. 818.) It differs from the plant described by Franchet; (1) by the tube of the corolla being hairy at the top; (2) by the staminal filaments being all hairy.

The series of the *Debiles* now contains 9 species which can be classified as follows.

Series Debiles.

- A. Leaves lanceolate, much longer than broad. Lower lip and staminal filaments glabrous.
 - a. Bracts pinnatipartite; lower lip angular with polygonal outline, shorter than the beak. . . . 1. *P. Heydei*, Prain.
 - b. Bracts palmatipartite; lower lip with rounded outline, as long as the beak. . . . 2. *P. Pheulpini*, Bonati.
- B. Leaves oval.
 - a. Sepals entire or very rarely bifid; staminal filaments and lip glabrous. . . . 3. *P. nudicaulis*, Bonati.
 - b. Lateral sepals incised.
 - *Lateral sepals serrate.
 - + Staminal filaments all glabrous. 4. *P. porrecta*, Wall.
 - ++ Two staminal filaments hairy. 5. *P. villosula*, Franch.
 - **Lateral sepals palmatilobed or palmatifid.
 - + Lower lip with ciliate edge.
 - + Staminal filaments glabrous. 6. *P. debilis*, Franch.
 - ± ± At least two staminal filaments hairy.
 - Δ Two filaments hairy, tube of the corolla glabrous.
 - 7. *P. verbenaeifolia*, Franch.
 - ΔΔ All the filaments hairy; tube of the corolla hairy on the upper part. 8. *P. Handel-Mazzettii*, Bonati.
 - ++ Lower lip with glabrous edge; staminal filaments glabrous.
 - 9. *P. confertiflora*, Prain.

Pedicularis *Pantlingii*, Prain., var. *chimiliensis*, Bonati.
Var. nov.

This plant has the appearance of *Pedicularis Pantlingii*, Prain

but is smaller in all its parts as indicated in the following table. It differs from the type species :—(1) by its shaggy calyx, not split in front, with lobes subequal, all incised; (2) by its hood gibbous in front and sharply contracted into the beak which is filiform, very long, truncate, and bifid in front, with angular lobes; the back covered with very short glandular hairs as in the type; (3) by the lower lip completely glabrous, with median lobe asymmetric, triangular, acute.

The staminal filaments are inserted on the middle of the tube of the corolla as in the type; two of these are perfectly glabrous, the other two being very slightly hairy.

	<i>P. Pantlingii</i> type.	<i>P. Pantlingii</i> , var. <i>chimaliensis</i> .
Stem	from 40-60 cm.	from 30-35 cm.
Petiole	2.5-6 cm.	2.5-5 cm.
Lamina of leaf	2.5 × 2.5-5 × 4.5 cm.	2.5 × 2.5-3 × 3 cm.
Lobes of leaf	5 mm. × 9 mm.	5 mm. × 9 mm.
Peduncles	0-3 mm.	3-8 mm.
Calyx	8 mm.	5 mm.
Tube of corolla	8 mm.	5 mm.
Lower part of hood	4 mm.	3 mm.
Anther-bearing part	5 mm. × 3 mm.	4 mm. × 2 mm.
Beak	5 mm.	5 mm.
Lower lip	17 mm.	10 mm.
Capsule	20 mm.	15 mm.
Seed	2 mm.	?

"Upper Burma :—Chimili Woods. Alt. 10,000 ft. In opener places of the alpine woodland. July 1919." R. Farrer. No. 1143.

Pedicularis praeruptorum, Bonati. Sp. nov. (*Rhyncholophae alternifoliae* e serie *Paucifoliatarum*, Prain).

Planta nana 5-8 cm. alta. Rhizoma verticale breve truncatum, radiculis crassis fusiformibus elongatis. Caulis solitarius simplex vel raro ramosus paulo foliosus plus minusve villosus basi squamis membranaceis lanceolatis obtusis basi dilatatis tectus. Folia lanceolato-linearia fere omnia radicalia alterna petiolata, 2-4 cm. longa; petiolis limbum aequantibus; limbo crasso supra glabro inferne villosa-lanato pinnatisecto; 6-10 jugis loborum oblongo-obtusorum pinnatilobulatum; lobulis obtusis. Folia caulinarum 1-2 radicalibus similia sed breviora ac brevius petiolata. Bractae inferiores foliiformes subsessiles; superiores cuneatae basi membranaceae dilatatae calycem aequantes. Flores ad summum caulis aggregati in cymis 6-8-floris. Pedunculi erecti vel patuli plus minusve villosi foliiformes 3-5 mm. longi. Calyx cylindricus circa 5 mm. longus antice non fissus dentibus 5 circa 1 mm. longis; dente superiore integro, laterali-bus basi filiformibus summo foliaceis plus minusve incis. Corolla purpurea, tubo cylindrico summo paulo dilatato et caly-

cem paulo superante; galea rectangulatim curvata, in parte verticali erecta et tubum aequante; in parte horizontali 3-4 mm. longa, non cristata lente attenuata in apicem rectum vel vix arcuatam plus minusve obliquum circa 4-5 mm. longum; labio inferiore superius aequante lato patulo margine dense ciliato breviter trilobato, lobis orbicularibus subaequalibus. Stamina ad medium tubi inserta; filamentis omnibus glabris. Capsula ac semina?

"S.E. Tibet:—On precipices, alpine turf, etc. at Ka-gwr-pw. Alt. 15,500 ft. July 1913." F. Kingdon Ward. No. 812. *pro parte* mixed with *P. Elwesii*, Hook f. and *P. quadrata*, Bonati.

This plant, allied to *P. yunnanensis*, Franch., has some analogies with *P. filicula*, Franch. and *P. Potanini*, Maxim. of the allied series *Caespitosa*. It differs from *P. filicula*, Franch. by (1) its radical leaves less numerous and with longer petioles; (2) its inflorescence in very short racemes; (3) its staminal filaments all glabrous. It differs from *P. Potanini*, Maxim. by (1) its inflorescence; (2) its small purple corolla (not yellow like that of *P. Potanini*, Maxim.); (3) the lower lip of the corolla being ciliate; (4) the staminal filaments glabrous.

Pedicularis nobilis, Bonati Sp. nov. (Paucifoliaeae).

Planta perennis, multicaulis. Rhizoma et radices? Caulis glabrescentes erecti vel ascendentes. Folia radicalia multa longe petiolata pinnatipartita, 8-9 jugis loborum triangulorum obtusorum, basi latorum ac decurrentium profunde lobulorum, lobulis obtusis; lobis inferioribus multo minoribus; petiolis 30-35 mm. longis compressis stricte alatis; limbo 35-65 mm. longo 15-20 mm. lato. Folia caulinarum alterna vel rarissime opposita radicalibus similia sed brevius petiolata, lobulis acutidentatis. Bracteae sessiles basi membranaceae, dilatatae ovato-oblongae pinnatilobatae floribus breviores. Flores multi magni elegantissimi breviter pedunculati, inferiores axillares sparsi, superiores in cymis terminalibus paucifloris; pedunculis 3-4 mm. longis erectis. Calyx villosus campanulatus circa 10 mm. longus membranaceus antice non fissus, lobis 5 subaequalibus basi constrictis et petiolulatis omnibus ovato-obtusis summo foliaceis ac incis, 2-3 mm. longis, nervis 10 non reticulatis. Corolla 25-28 mm. longa purpureo-splendens raro alba extus glabra; tubo cylindrico extus glabro vel trichomis raris munito, ab ore calycis arcuato, calycem duplo superante, 3-4 mm. lato, summo paulo dilatato, intus ad insertionem staminum villosus; galea glabra maxima angulosa latissima in parte posteriore erecta, 5 mm. longa, in anteriore 10 mm. longa, 5 mm. lata; crista minima summo rectangulatim curvata et abrupte constricta in

apicem brevissimum, 2-3 mm. longum, decumbentem, summo lineatum ac bifidum; margine galeae dentibus 2 obtusis instructo; labio inferiore superius aequante basi breviter stipitato maximo, 10-12 mm. longo, 15-16 mm. lato; margine profunde denticulato paulo vel non ciliato; lobo medio lateralibus multo minore suborbiculare. Stamina filamenta omnia dense villosa. Capsula ac semina?

"Upper Burma:—Imaw Bum. Alt. 13,000 ft. In meadow pockets on the N. face of the mountain with *Cremanthodium*, *Potentilla*, *Primula*, etc. Flowers bright crimson—two white specimens were also found. July 1919." F. Kingdon Ward. No. 3399.

"Upper Burma:—Chimili Alps. Alt. 12,500 ft. Common on cliffs and broken ground in the high alpine lawns. August 1919." R. Farrer. No. 1200.

A very elegant plant allied to *P. filicula*, Franch. and *P. Forrestiana*, Bonati. It differs from the first, though it has the same angular hood and short beak, by (1) its much larger flowers; (2) its filaments all hairy. It differs from *P. Forrestiana*, Bonati by (1) the form of the calyx; (2) the lower lip slightly or not at all hairy; (3) the staminal filaments very hairy; (4) the very different form of the hood.

The series of the *Paucifoliatae*, Prain contains at present 6 species which can be distinguished by the following key.

Series *Paucifoliatae*.

A. Lower lip of the corolla ciliate.

*Filaments all glabrous.

Dwarf plant with stem robust, erect, 5-8 cm. high; flowers in a head; tube of the corolla scarcely exceeding the calyx. 1. *P. praeruptorum*, Bonati.

**At least two staminal filaments hairy; tube of the corolla twice as long as the calyx.

+ Two staminal filaments hairy; stem with few or no leaves. 2. *P. yunnanensis*, Franch.

++ All the staminal filaments laxly hairy; cauline leaves numerous. 3. *P. Forrestiana*, Bonati.

B. Lower lip of the corolla glabrous.

*Two staminal filaments hairy; plant robust.

. 4. *P. tsangchanensis*, Franch.

**All the staminal filaments hairy.

△ Lower lip of the corolla with denticulate margin; hood angular, sharply contracted into the beak which is short and bifid at the top. Flowers very numerous.

. 5. *P. nobilis*, Bonati.

△△Lower lip of the corolla not emarginate, entire; tube of the corolla twice as long as the calyx; hood not angular gradually merging into the short beak. Plant with few flowers, flowers small. . . . 6. *P. Wallichii*, Bunge.

***Pedicularis tongtchouanensis*, Bonati. Sp. nov. (Racemosae).**

Planta perennis. Radix? Caules erecti glabri basi cylindrici, summo plus minusve angulosi, paulo foliati. Folia radicalia rosulata ex *Maire*. Folia caulinaria alterna breviter petiolata lanceolata obtusa in marginibus tenuiter ac leviter pinnatisecta omnino glabra basi cuneiformia, petiolis 2-5 mm. longis, limbo 30-60 mm. longo, 5-15 mm. lato. Bractae filiformes sessiles; superiores lineares serratim dentatae floribus breviores. Flores inferiores subsessiles, superiores sessiles, in spicis terminalibus paucifloris dispositi. Calyx crassus, 10-12 mm. longus cylindricus antice profunde fissus glaber; lobis duobus in marginibus inciso denticulatis, brevibus ac filiformiter (circa 1 mm. long.) mucronatis. Corolla alba dilute rosea, grandis, 30-35 mm. longa, tubo recto cylindrico summo paulo dilatato, 15-20 mm. longo, extus glabro; galea glabra, 10-15 mm. longa falciformi et in rostrum conicum ac obtusum attenuata (1-2 mm. long.). Labium inferius galeam aequans superficialiter trilobatum, lobo medio minimo, lobis lateralibus acuminatis ac omnibus pilis raris ciliatis. Stamina ad ovarii summum inserta, filamentis omnibus glabris; antheris oblongis, orbiculatis ac summo breviter scissis, loculamentis longe attenuatis ac breviter apiculatis. Capsula calyce duplo longior obliqua breviter rostrata. Semina ovata tuberculosa.

East Yunnan:—"Hautes montagnes à Tong-Tchouan. Alt. 3,200 m. *Pedicularis* vivace, feuilles de la base en rosette; fl. blanc lavé de rose. Sept." E. E. *Maire sine num.*

Plant closely allied to *P. nigra*, Vaniot, which grows in the same region. It differs from it by its middle and lower leaves being petiolate; by its dentate calyx lobes, by its glabrous staminal filaments, etc.

The series of *Racemosae* now contains 7 species which can be classified according to the following table.

Series *Racemosae*.

A. Calyx with segments entire.

a. Beak long.

*Hood sharply contracted into a long filiform beak.

1. *P. yezoensis*, Maxim.

**Hood gradually tapered.

+Lower lip ciliate.

2. *P. resupinata*, Linn.

++ Lower lip glabrous. 3. *P. racemosa*, Dougl.

b. Beak short or very short.

* Plant glabrous, with lanceolate acute leaves; calyx glabrous. 4. *P. nigra*, Vaniot.

** Plant pubescent, with obtuse leaves, calyx hairy.

. 5. *P. Collettii*, Prain.

B. Calyx with segments incised or dentate.

* Beak long; corolla small, two filaments hairy; lower lip glabrous. 6. *P. lanceolata*, Michx.

** Beak very short; corolla very large, 35 mm.; upper bracts shorter than the flowers; staminal filaments glabrous; lower lip ciliate. 7. *P. tongtchouanensis*, Bonati.

Pedicularis galeata, Bonati. Sp. nov. (Tristes).

Rhizoma horizontale elongatum glabrum radicibus filiformibus plurimis et squamis membranaceis fuscis lanceolato-acutis 6-10 mm. longis tectum. Caules erecti solitarii simplices angulosi villosissimi. Folia radicalia? Caulinaria multa glabra sessilia basi truncata non auriculata ovato-obtusa, 35-40 mm. longa, circa 15 mm. lata, pinnatilobata, lobis ovato-obtusis acutidentatis, circa 2-3 mm. longis ac latis. Bracteae inferiores foliiformes, superiores rhomboidales, palmatilobatae floribus breviores. Flores axillares pauci subsessiles, summo caulis in uvis spiciformibus brevibus ac basi interruptis conjuncti. Calyx membranaceus vesiculosus 8-10 mm. longus, dentibus 5 aequalibus pinnatilobulatis 5 mm. longis; nervis reticulatis. Corolla luteola; galea atro-purpurea fere nigra 20-25 mm. longa; tubo 1 cm. longo recto extus ac intus ad insertionem staminum villosio calycem aequante; galea circa 1 cm. longa, sicut in *P. tristis*, Linn., dorso rotundo ac paulo villosio antice clauso summo rotundo brevissime attenuato in apicem vix 1 mm. longum obtusum, margine glabro; labio inferiore galeam aequante vel paulo superante, margine ciliato, tripartito vel fere trisecto, lobis subaequalibus, medio ovato-obtuso, lateralibus linearibus forte arcuatis triangularibus summo obtusis. Stamina medio tubi corollae inserta glabra.

"West China:—Mekong-Salween divide, Yunnan. On open, stony pasture on ledges of cliffs. Lat. 28°12'N. Alt. 14,000 ft. Plant of 7-12 ins. Flowers, base yellowish, apex and beak deep black-crimson. August 1917." G. Forrest. No. 14,697.

Plant allied to *P. tristis*, Linn. from which it differs:—(1) by the form and membranous consistency of its leaves; (2) by its membranous calyx, very slightly hairy, with lobes broad, obtuse, and deeply incised; (3) by its hood with edge glabrous and with back very slightly hairy, whereas *P. tristis*, Linn. has the edge of the hood very hairy; (4) by the lower lip very deeply

lobed with ciliate edge while in *P. tristis* the lip is glabrous; (5) by the throat of the corolla being without the two very prominent ridges which are present in *P. tristis*; (6) by its stamens with anthers rounded at the top and with lobes long-tapered to a point while the stamens of *P. tristis* are cordiform at the top and have the lobes short and obtuse.

Series Tristes.

- A. Species with hood terminating in a long beak.
 - a. Leaves all, or nearly all, radical, finely cut; beak long terminated by a pencil of hairs; lip small, tripartite.
 - 1. *P. lachnoglossa*, Hook. f.
 - b. Stems leafy; beak not terminated by a pencil of hairs.
 - α Beak longer than the lower lip.
 - *Leaves crenate.
 - + Hood hairy over its whole surface, lower lip tripartite.
 - Δ Corolla yellow; tomentum of hood bright yellow.
 - 2. *P. lasiophrys*, Maxim.
 - ΔΔ Corolla white or rose; tomentum ash-coloured.
 - 3. *P. cinerascens*, Franch.
 - + + Hood hairy only on the edge; lower lip trifid.
 - 4. *P. craspedotricha*, Maxim.
 - **Leaves pinnatisect.
 - + Beak horizontal; corolla yellow.
 - 5. *P. proboscidea*, Stev.
 - + + Beak pendant; corolla red.
 - 6. *P. recurva*, Maxim.
 - β Beak shorter than the lip or at the utmost as long as the lip.
 - *Hood with ciliate edge tapered into a broad and conical beak.
 - + Leaves pinnati-partite; hood with back hairy; spike short and dense.
 - 7. *P. Clarkei*, Hook. f.
 - + + Leaves simply crenate; hood with back glabrescent, ciliate on the edges.
 - Δ Bracts exceeding the flowers in length; plants of very large size, hairy.
 - ± Filaments all hairy; teeth of calyx denticulate.
 - 8. *P. ingens*, Maxim.
 - ± ± Filaments all glabrous; teeth of calyx entire.
 - 9. *P. pseudo-ingens*, Bonati.
 - ΔΔ Bracts equalling or scarcely exceeding the flowers.
 - Plants glabrous. Teeth of calyx entire.
 - ± Tube of the corolla twice as long as the calyx; edge of the hood furnished on each side with an obtuse extension; staminal filaments glabrous.
 - 10. *P. tongolensis*, Franch.

± ± Tube of the corolla equalling the calyx; two staminal filaments hairy; edge of hood simple, lower lip denticulate. 11. *P. Steiningeri*, Bonati.

**Hood ending in a pendant beak; lower lip broadly reniform.

+ Calyx not split in front, with lobes short and entire; hood hairy only on the edge; two filaments hairy.

12. *P. brachystachys*, Bunge.

+ + Calyx split in front with teeth large and incised; hood entirely hairy.

△ Tube of the corolla slightly exceeding the calyx and bent at its exit from the latter; lower lip with lobes subequal; beak semi-circular.

13. *P. trichoglossa*, Hook. f.

△△ Tube of the corolla $1\frac{1}{2}$ times as long as the calyx, not bent; lower lip with median lobe smaller than the lateral; beak scarcely arched.

14. *P. rhodotricha*, Maxim.

B. Species without beak.

a. Hood boat-shaped, open in front.

*Plant hairy or shaggy.

+ Tube of the corolla hairy on exterior.

△ Tube of the corolla equalling the calyx; teeth of the calyx lanceolate.

15. *P. decora*, Franch.

△△ Tube of the corolla twice as long as the calyx; lobes of calyx obtuse.

16. *P. rudis*, Maxim.

+ + Tube of the corolla glabrous on exterior.

△ Two staminal filaments glabrous, the two others hairy at the base; calyx with tooth at apex entire.

17. *P. aequibarbis*, Handel-Mazzetti.

△△ Filaments all glabrous.

± Calyx with teeth linear, acute, entire or obscurely denticulate; tube of the corolla twice as long as the calyx. Plant of large size (90 cm. or more).

18. *P. Dunniana*, Bonati.

± ± Calyx with teeth obtuse, deeply incised; tube of the corolla equalling or scarcely exceeding the calyx; plant from 40–45 cm.

19. *P. Prainiana*, Maxim.

**Plants glabrous or glabrescent; staminal filaments glabrous; lower lip ciliate.

+ Plant of very large size; hood bent, enlarged at the extremity.

20. *P. princeps*, Bur. et Franch.

+ + Plant of 30–40 cm. with angular stem; hood straight, upright, tapered and subacute at the extremity.

21. *P. dolichocymba*,* Handel-Mazzetti.

*= *P. tristiformis*, Bonati.

b. Hood closed in front.

*Radical leaves very large (20–30 cm.), pinnatisect.
22. *P. pteridifolia*, Bonati.

**Leaves all similar.

+ Lobes of calyx obtuse, deeply incised; edge of hood glabrous; lower lip hairy; anthers with acute lobes.
23. *P. galeata*, Bonati.

+ + Lobes of calyx lanceolate-acute, entire or serrate; edge of hood hairy; anthers with obtuse lobes; throat with two ridges much developed. 24. *P. tristis*, Linn.

Pedicularis densipica, Franch., var. *Schneideri*, Bonati.

Var. nov.

This differs from *P. densipica*, Franch. by its taller habit, 40 cm. or more, its leaves verticillate in fours, patent or reflexed, 40–45 mm. long, about 20 mm. broad, its bracts much more elongate, patent or reflexed, two or three times as long as the flowers, its calyx with segments longer stalked and itself 10–12 mm. long, its corolla about 15 mm. long, and finally by its staminal filaments being all hairy.

West China:—"Yunnan, in pratis humidis inter Yung-pegting et Taowang; fls. rosei. Alt. 2,400 m. Jul. 1914." Camillo Schneider. No. 1710. Iter chinense, 1914, Societatis dendrologicae Austriae et Hungariae.

Pedicularis Wardii, Bonati. Sp. nov. (Fragiles).

Planta nana. Rhizoma horizontale nodosum, internodiis squamis lineatis fuscis tectis; radiculis linearibus subfiliformibus elongatissimis (8–10 cm.). Caules multi ascendentes angulosi glabri basi sublignosi herbacei decumbentes summo ac plus minusve ramosi 6–10 cm. alti. Folia opposita petiolata glabra vel pilis raris ciliata; petiolis inferioribus 1–2 cm. longis, superioribus brevioribus (5–10 mm.), stricte alatis; limbo ovato pinnatisecto, loborum 5–6 jugis; lobis inferioribus petiolulatis, superioribus subsessilibus, inde sessilibus, omnibus ovato-oblongis obtusis plus minusve profunde pinnatilobulatis; lobulis acutidentatis. Bractee foliiformes. Flores in axillis foliorum singuli pedunculati; pedunculis erectis deinde decumbentibus 1–2 mm. longis glabris. Calyx membranaceus perlucidus infundibuliformis circa 4 mm. longus antice non fissus margine ciliatus, dentibus 5 lanceolato-lineatis acutis circa 1 mm. longis glabrescentibus; nervis primariis 5 in medio loborum, secundariis 5 in intersectione loborum non reticulatis. Corolla albo-flava, tubo erecto cylindrico circa 8 mm. longo circa 2 mm. diametro, calycem duplo

superante, interne paulo villosa; galea falciformi, dorso glabra, tubum aequante, summo obtusa ac rotunda, margine solum inferne pilis raris ciliato; labio inferiore brevissimo (2-2.5 mm.), lineato margine ciliato usque ad medium in lobos 3 fissos; lobis lateralibus ovato-acutis planis, medio latiore obtuso rotundo ac concavo, fauce cristis 2 parallelis maximis addito. Stamina ad basin tubi corollae inserta; filamentis omnibus glabris; antheris longe apiculatis.

"S.E. Tibet:—Ka-gwr-pw Temple. Abies forest. Alt. 15,000 ft. July 1913." F. Kingdon Ward. No. 881.

A dwarf plant belonging to the series *Fragiles* of Prain and a near ally of *P. Legendrei*, Bonati. It differs from that species by its small size, its stems sub-lignose at the base, its corolla yellow and hood glabrous on the back and scarcely ciliate on the edge, the lower lip very short, and finally by its staminal filaments being all glabrous. It differs from *P. Kingii*, Prain of which the corolla is white, by its calyx not split in front, by its filaments being glabrous and inserted at the base, by the form of its leaves, etc.

The series of the *Fragiles* of the section *Anodontae-verticillatae* now contains four species which can be easily distinguished by the following table.

- | | | |
|----|---|----------------------------------|
| A. | Calyx split in front; corolla white, hood without beak and with glabrous edge; lower lip glabrous, two filaments hairy. | 1. <i>P. Kingii</i> , Prain. |
| B. | Calyx split in front; lower lip ciliate. | |
| | *Hood without beak, calyx with very short lobes. | |
| | + Plant of large size; corolla rose; hood hairy on the back and on the edge; lower lip nearly as long as the hood; two filaments hairy. | 2. <i>P. Legendrei</i> , Bonati. |
| | + + Plant dwarf; corolla yellow; hood glabrous on the back and on margin, scarcely ciliate at the base; lower lip much shorter than the hood; filaments all glabrous. | 3. <i>P. Wardii</i> , Bonati. |
| | **Hood terminating in a beak short and truncated, calyx with lobes elongated; corolla green. | 4. <i>P. fragilis</i> , Prain. |

If we seek to determine what is the geographical distribution of the series of the *Fragiles* we find that:—*P. fragilis*, Prain and *P. Kingii*, Prain both inhabit the Eastern Himalaya, the first Assam, the second Sikkim and Chumbi; *P. Legendrei*, Bonati has been found up to the present only from Eastern Szechwan; finally *P. Wardii*, Bonati is known so far only from S.E. Tibet.

The centre of evolution, and until we get further information,

the centre of creation of the series should therefore be placed in the south-east of Tibet. It must be added that Dr Handel-Mazzetti of the Botanical Institute of the University of Vienna, who has recently spent five years in China and has reported some new species from West Yunnan (Plateau of Chungtien), has informed me of the presence of *P. Kingii*, Prain in the regions which he has explored. If this is correct it would serve as an argument in support of the supposition I have made above.

Pedicularis lutescens, Franch., var. *brevifolia*, Bonati.
Var. nov.

This variety has all the essential characters of *P. lutescens*, Franch. but is a dwarf plant of 9-15 cm., annual, very hairy; stem simple; leaves similar to those of *P. deltoidea*, Franch., very hairy, 5-7 mm. long, oval-oblong, subsessile; calyx relatively shorter, 7-8 mm.; tube of the corolla 2-3 times as long as the calyx; hood and lower lip as in the typical form.

"West China :—Northern Yunnan. On stony pasture and in open pine forests on the N.W. flank of the Lichiang Range. Lat. 24° 30' N. Alt. 11,000 ft. Plant of 3-5 ins. Flowers pale yellow. Aug. 1914." G. Forrest. No. 13,028.

Pedicularis lutescens, Franch., var. *ramosa*, Bonati. Var. nov.

Plant annual, much branched at the base, with branches divaricate, glabrescent at the base, very hairy at the top; leaves suborbicular, obtusely crenulate with somewhat long petioles; petioles about 5 mm. long, lamina 10 mm. long and as much broad; bracts with membranous broadly dilated base. Floral characters of type; tube of corolla not exceeding the calyx.

"West China :—Marshy, stony pasture on the mountains in the N.E. of the Yangtze bend, Yunnan. Lat. 24° 45' N. Alt. 11,000-12,000 ft. Plant of 2-4 ins. Flowers yellow. August 1913." G. Forrest. No. 10,775.

Pedicularis lutescens, Franch., var. *tongtchouanensis*, Bonati.
Var. nov.

Plant robust, stems hairy, more or less flexuose, 20 cm. high or over, rarely branched; leaves hairy, subsessile, oval-oblong, 29-30 mm. long, deeply pinnatilobed with triangular obtuse lobes; petioles 2-3 mm. long, calyx membranous, deeply split in front into 5 lobes which are lanceolate, acute, much longer than broad, the top one entire, the lateral ones dentate; tube of the corolla 1½ times as long as the calyx, narrow; hood very long at the base and in a straight line with the tube, narrow (1.5 mm.), as

long as the tube; back strongly arched; margin with 8-10 teeth on each side.

E. Yunnan :—Tong-tchouan. E. E. Maire.

Pedicularis cymbalaria, Bonati. Sp. nov. (Lyratae).

Planta annua? Radix 5-6 cm. longa, radiculis multis divaricatis elongatis. Caules diffusi repentes vel ascendentes, cylindrici ac basi glabrescentes, summo plus minusve angulosi ac villosi, ramosi, ramis oppositis ac divaricatis, 10-15 cm. longi. Folia opposita longe petiolata glabrescentia suborbiculata, basi truncata vel cordata, circa 1 cm. longa ac lata, palmatilobata, lobis brevibus ac latis obscure lobulatis; petiolis 10-20 mm. longis margine membranaceis alatis, basi dilatatis. Bractee foliiformes. Flores omnes axillares oppositi longe pedunculati, pedunculis 5-20 mm. longis glabris erectis. Calyx villosus campanulatus 10-12 mm. longus, usque ad medium fissus in lobos 5 inaequales; lobo summo lanceolato-lineato acuto integro; lobis posterioribus latissimis flabellatis profunde palmatilobulatis; anterioribus ovato-elongatis basi constrictis summo pinnatilobulatis, lobulis rotundis; nervis reticulatis paulo eminentibus. Corolla glabra, azurea vel rosea, 20-25 mm. grandis, tubo brevi 3-4 mm. cylindrico extus glabro, intus fauce et ad insertionem staminum villosa; galea falciformi elongata, circa 20 mm. longa, erostrata horizontaliter truncata, summo obtuso, margine inferiore quoque latere addito dente filiformi elongato a summo circa 4 mm. distante; labio inferiore galea brevior, 10-12 mm. longo, lobis 3 subaequalibus medio paulo eminente emarginato margine glabro, lateralibus margine denticulatis ac plus minusve ciliatis. Stamina filamenta omnia glabra, ad summum ovarii inserta; antheris summo truncatis, loculamentis breviter attenuatis acutis.

"West China :—Moist, stony pasture on the Mekong-Salween divide, Yunnan. Lat. 28° 10' N. Alt. 13,000 ft. Plant of 2-3 ins. Flowers pale rose. August 1914." G. Forrest. No. 13,222.

"S.E. Tibet :—On moist, shady banks in pine forest on Kagr-pw, Mekong-Salween divide, Tsarong. Lat. 28° 30' N. Alt. 11,000 ft. Plant of 4-6 ins. Flowers light blue. August 1914." G. Forrest. No. 14,582.

This species is allied to *P. lutescens*, Franch. of which it has most of the floral characters. It differs by :— (1) its habit, its creeping stems, the form of its leaves, its longer petioles and peduncles, etc.; (2) the light blue or rose colour of its corolla; (3) the lower lip half the length of hood with lobes subequal, the median projecting only slightly, emarginate, non-denticulate and glabrous; (4) the hood having a single tooth on each of the lower margin.

It differs from *P. pseudostenocorys*, Bonati, which also has only one tooth on each side of the lower margin of the hood, by:—(1) its habit, the form of its leaves, the colour of its corolla; (2) the form of its calyx; (3) its staminal filaments all glabrous; (4) the lower lip with lateral lobes crenulate and slightly ciliate.

The series of the *Lyratae* to which I again attach the *Ternatae* separated in error in 1910, contains now 6 species which can be arranged as follows:—

Series *Lyratae*.

- A. Radical leaves very large, 20–25 cm. with long petioles, bipinnatifid; teeth of calyx entire; only one tooth on each side of the margin of the hood. 1. *P. cernua*, Bonati.
- B. Leaves all similar.
 - + Hood having only one tooth on each side of the lower margin.
 - *Two staminal filaments hairy; lower lip with margin not crenulate; leaves pinnatifid; corolla yellow. 2. *P. pseudostenocorys*, Bonati.
 - **All the filaments glabrous; lateral lobes of the lower lip crenulate and ciliate with scattered trichomes; corolla rose or blue; leaves palmatilobed; plant creeping. 3. *P. cymbalaria*, Bonati.
 - + + Lower margin of hood with several teeth on each side.
 - *Calyx with teeth entire; corolla yellow, with three to five teeth on each side of the margin of the hood. 4. *P. lyrata*, Prain.
 - **Calyx with teeth incised.
 - △ Hood with two teeth on each side of the lower margin; two filaments hairy; corolla small, red; tube of corolla twice as long as the calyx; leaves small, deltoid, shortly petiolate. 5. *P. deltoidea*, Franch.
 - △△ Lower margin of hood with four or six teeth; filaments glabrous; tube of the corolla of the same length as the calyx; corolla large, yellow; leaves large. 6. *P. lutescens*, Franch.

Pedicularis atra, Bonati. Sp. nov. (Bidentatae verticillatae e serie *Melampyriflorarum*).

Radix? Caulis glaber simplex erectus, 40–50 cm. altus, basi cylindricus, summo quadrangulosus. Folia glabra quaterne ver-

ticillata longe petiolata; petiolis plus minusve basi alatis, inferioribus 15–30 mm. longis, superioribus brevioribus (circa 10 mm.); limbo 5–6 cm. longo, 15–30 mm. lato, ovato-oblongo obtuso pinnatifido, 10–12 jugis loborum ovato-obtusorum et acutidentatorum. Bractee inferiores foliiformes, subsessiles, basi in petiolos alatos attenuatae; superiores basi membranaceae, latae, perlucidae, limbo foliaceo ovato-obtuso superficialiter acutidentato; omnes floribus breviores, superiores fere calycem aequantes. Flores inferiores axillares oppositi et pedunculati, superiores sessiles in spicis 4–5 cm. longis paucifloris. Calyx glaber angulosus, nervis 8 non reticulatis, circa 1 cm. longus, superficialiter antice fissus, lobis 3 inaequalibus; lobo summo brevissimo (circa 1–2 mm.) lineato integro vel vix denticulato; lobis lateralibus majoribus inciso-crenatis summo fissis in lobulos 2 ovato-obtusos raro mucronatos acutidentatos 1.5–2 mm. longos, circa 1 mm. latos. Corolla purpurea circa 3 cm. longa; tubo cylindrico calycem paulo superante, circa 1 cm. longo, glabro basi rectangulatim curvato; galea obliqua falciformi glabra, circa 15 mm. longa, rotunda antice in sacco clausa; margine inferiore quoque latere dente parvo addito, distante 2–3 mm. a summo; labio inferiore circa 1 cm. longo, galea brevior, erecto margine glabro paulo profunde trilobato, lobis 2–3 mm. longis, circa 5 mm. latis, lateralibus majoribus ovato-rotundis, medio multo brevior ovato-obtuso vel superficialiter trilobulato, 2 mm. longo ac lato; galea paralleliter bicristata. Stamina ad trientem inferiorem tubi inserta; filamentis omnibus glabris; antherarum loculis breviter apiculatis. Capsula ac semina?

“Upper Burma:—By streams in marshy meadows, and steep banks; limestone; flowers crimson. Valley of Naw-chaung. Aug. 1914.” F. Kingdon Ward. No. 1918.

A plant belonging to the series of the *Melampyriflorae*. Its habit is similar to that of *P. pseudo-atra*, Bonati and recalls that of *P. chamissonis*, Stev., of Japan. Its flowers much exceeding the bracts and decumbent are characteristic. Its calyx has a form recalling that of *P. Mairei*, Bonati.

Pedicularis pseudo-atra, Bonati. Sp. nov. (*Melampyriflorae*).

Planta *P. atrae*, Bonati valde affinis ac primo conspectu absolute similis. Rhizoma obliquum breve truncatum, radiculis filiformibus elongatissimis. Caulis simplex erectus glaber angulosus circa 40 cm. altus. Folia radicalia caduca; caulinaria 4-verticillata glabra erecta petiolata ovato-oblonga, basi truncata, summo acuta, profunde pinnatifida, 10–12 jugis segmentorum lineato-obtusorum basi decurrentium profunde acutidentatorum; petiolis 15–20 mm. longis compressis ac stricte alatis; limbo 45–60 mm. longo, 15–25 mm. lato. Bractee inferiores flores

aequantur (10-12 mm.), lineares vel oblongae petiolulatae, petiolo 4-5 mm. longo; limbo pinnatilobato, 15-20 jugis loborum triangularium acutorum. Flores sessiles erecti, in spica terminali compacta ac pauciflora. Calyx membranaceus perlucentis, circa 10 mm. longus, glaber, costis vel nervis primariis 5 non reticulatis, lobis 5 triangularibus acutis, circa 1 mm. longis, plus minusve incis. Corolla purpurea 20-25 mm. longa; tubo circa 10 mm. longo cylindrico glabro, 10 mm. longo erecto; galea glabra, 10 mm. longa, in parte inferiore obliqua 5 mm. longa, in parte verticali 5-6 mm. longa, crista summo profunde saccata, in parte inferiore finita in apicem brevissimum obtuse truncatum et dentibus duobus brevibus additum; labio inferiore galeam aequante glabro basi stipitato, lobis ovato-obtusis, medio lateralibus minore. Stamina prope basin tubi inserta; filamentis duobus villosis; antheris truncatis et summo obscure cordatis, loculentis longe apiculatis. Capsula ac semina?

"Upper Burma:—Laktang. Alt. 9,000 ft. Flowers crimson, in meadows or under bamboos, not too heavily shaded. Aug. 1919." F. Kingdon Ward. No. 3581.

Plant allied to *P. atra*, Bonati, from which it differs by two of its staminal filaments hairy, and its calyx with teeth entire.

Pedicularis Reynieri, Bonati. Sp. nov. (Melampyridae).

Planta perennis villosa stolonifera. Radix ac stolones cum tuberculis villosis, 2-3 mm. diametro et parasito cryptogamo quod apparet ortis; radiculis filiformibus rectangulariter ramificatis. Caules graciles decumbentes flexuosi simplices vel paulo ramificati angulosi villosissimi, 30-40 cm. longi. Folia villosa 4-verticillata, inferiora multo mediis ac superioribus minora (5-10 mm.), caduca petiolata; petiolis 3-4 mm. longis; media ac superiora subsessilia, inde sessilia; limbo 20-25 mm. longo. 10-15 mm. lato, triangulari obtuso pinnatifido, segmentis ovato-obtusis acutidentatis, paucis (7-9), longis 5-7 mm. latis 3-4 mm. Bractae foliiformes superiores flores aequantes profunde dentatae sessiles. Flores axillares 4-verticillati sessiles vel subsessiles. Calyx brevis (6-7 mm.) cylindricus membranaceus paulo villosus, nervis 5 eminentibus; nervis secundariis paulo apparentibus reticulatis; tubo circa 5 mm. longo; lobis 2 mm. longis aequalibus basi contractis ac subfiliformibus, summo lanceolatis et acutidentatis. Corolla albiflava; tubo 10 mm. longo extus villosissimo; galea recta (quod est tubum recte sequens), circa 5 mm. longa, dorso rotunda, finita in apicem circa 1 mm. longum oblique truncatum ac margine inferiore quoque latere dente brevi additum, trichomis ac pilis glandulosis dense tectum; labio inferiore galeam aequante (circa 5 mm.), margine dense ciliato, fauce cristis duabus eminentibus addito, lobo medio

truncato, lateralibus brevioribus triangulato-acutis. Stamina ad medium tubi corollae inserta, filamentis omnibus glabris. Capsula ac semina?

"Upper Burma. Laktang. Alt. 8,000 ft. In leaf mould in upper part of forest among thin undergrowth, also in heavily-shaded gully where the *Primulas* grow. Lips of the flowers pale lemon-yellow, fading to colourless in the tube. August 1919." F. Kingdon Ward. No. 3572.

A plant of peculiar appearance; in its stamens with filaments all glabrous and its calyx with five teeth it approaches *P. melampyriflora*, Franch.; it is easily distinguished from that species by its hood being very hairy and without crest, by its appearance, etc.

The discovery by Mr Kingdon Ward of *P. atra*, Bonati, *P. pseudo-atra*, Bonati and *P. Reynieri*, Bonati increases to 7 the number now known of the series of the *Melampyriflorae*. The whole of the series is reviewed in the following table.

Series *Melampyriflorae*.

A. Staminal filaments all glabrous.

*Calyx with five teeth.

+ Hood with a crest. 1. *P. melampyriflora*, Franch.

+ + Hood without crest, very hairy. 2. *P. Reynieri*, Bonati.

**Calyx with three teeth, the two lateral sometimes superficially bifid.

+ Hood with a crest and terminating in a short beak; leaves fleshy, pinnatisect with linear segments.

3. *P. Mairei*, Bonati.

+ + Hood without crest, no beak; leaves membranous, pinnatifid, with segments broadly oval.

4. *P. atra*, Bonati.

B. At least two staminal filaments hairy.

*Only two staminal filaments hairy.

+ Hood with crest, and very short beak. Plant of large size, shaggy, branched.

5. *P. pseudo-melampyriflora*, Franch.

+ + Hood without crest and without beak; teeth of calyx triangular, acute, entire, equal; plant glabrous, with stem simple.

6. *P. pseudo-atra*, Bonati.

**All the filaments hairy.

Hood with a crest and a short beak; teeth of calyx unequal, more or less incised. 7. *P. floribunda*, Franch.

Pedicularis multicaulis, Bonati. Sp. nov. (*Verticillatae*).

Planta annua vel biennis? Radix fibrosa. Caules plurimi

(10-12), simplices erecti 10-25 mm. alti angulosi subalati glabri vel paulo villosi. Folia pingua ovato-obtusa glabra, inferiora breviter petiolata, superiora subsessilia, limbo 5-10 mm. longo pinnatilobato; jugis 4-5 lorum triangularium vel ovatorum acutidentatorum. Bractee foliiformes sessiles. Flores in verticillis plurimis et sparsissimis; inflorescentia ad 15 cm. longa et ultra. Calyx globosus membranaceus perlucidus glaber vel vix margine ciliatus, nervis non reticulatis, dentibus 5 aequalibus 1 mm. longis, medio subulato, lateralibus linearibus obtusis vix crenatis; tubo 3-4 mm. longo. Corolla purpurea patula, tubo ab ore calycis curvato, 6-10 mm. longo, summo latiore, extus glabro ac intus ad insertionem staminum; labio inferiore glabro profunde trilobato, lobis emarginatis; medio paulo proeminente, lateralibus divergentibus. Stamina medio tubi inserta; filamentis duobus villosis. Capsula patula glabra lucens, circa 10 mm. longa, mucronata. Semina ovata basi apiculata reticulata, magna, 2 mm. longa.

"Upper Burma:—Paijawng Bum. Lat. $26^{\circ} 10'$ N. Long. $98^{\circ} 30'$ E. Alt. 12-13,000 ft. Flowers pale purple or pinkish-purple, with darker reticulations on the lower spreading lip. On open grassy slopes and ledges facing N. at the summit. July 1919." F. Kingdon Ward. No. 3440.

"Chimili Valley. Alt. 11-12,000 ft. Open alpine fields and crags. July 1919." R. Farrer. No. 1142.

LIST OF DETERMINATIONS

Forrest

| | | |
|-------|---|---|
| 6015 | <i>P. integrifolia</i> , Hook. f. | Eastern flank of the Lichiang Range. 27° 30' N. 11,000 ft. July 1910. |
| 7605 | <i>P. Henryi</i> , Maxim. | Hills to the east of Tengyueh. 25° N. 6,000 ft. May 1912. |
| 7849 | <i>P. Henryi</i> , Maxim. | Ming-kwong Valley. 25° 15' N. 7,000 ft. May 1912. |
| 8050 | <i>P. polyphylla</i> , Franch. | Hills east of Tengyueh. 25° N. 6-7,000 ft. June 1912. |
| 8950 | <i>P. taliensis</i> , Bonati | Western flank of the Shweli-Salween divide. 25° 20' N. 9-10,000 ft. August 1912. |
| 8955 | <i>P. gracilis</i> , Wall. | Western flank of the Shweli-Salween divide. 25° 20' N. 10-11,000 ft. August 1912. |
| 9028 | <i>P. Monbeigiana</i> , Bonati | Western flank of the Shweli-Salween divide. 25° 20' N. 11,000 ft. rose. August 1912. |
| 9146 | <i>P. Monbeigiana</i> , Bonati
var. <i>birmanica</i> , Bonati. | Upper Burma. Summit of the Sansi Gorge. 25° 25' N. 9,500 ft. Fls. bright rose. Sept. 1912. |
| 10111 | <i>P. lachnoglossa</i> , Hook. f. | Lichiang Range. 27° 30' N. 13-14,000 ft. Fls. crimson-rose. June 1913. |
| 10129 | <i>P. integrifolia</i> , Hook. f. | Lichiang Range. 27° 30' N. 11,000 ft. July 1913. |
| 10150 | <i>P. integrifolia</i> , Hook. f. | Open chalky pasture on the Lichiang Range. 27° 30' N. 10-11,000 ft. Fls. deep crimson. June 1913. |
| 10201 | <i>P. Elwesii</i> , Hook. f. | Lichiang Range. 27° 35' N. 12-13,000 ft. June 1913. |
| 10360 | <i>P. Forrestiana</i> , Bonati | Mountains in the N.E. of the Yangtze bend. 27° 45' N. 12-13,000 ft. July 1913. |
| 10445 | <i>P. polyphylla</i> , Franch. | Open, stony pasture in the mountains in the N.E. of the Yangtze bend. 27° 45' N. 11,000 ft. July 1913. |
| 10480 | Indeterminable | No flowers. |
| 10490 | <i>P. integrifolia</i> , Hook. f. | Mountains in the N.E. of the Yangtze bend. 27° 45' N. 12,000 ft. July 1913. |
| 10550 | <i>P. polyphylloides</i> , Bonati | Mountains in the N.E. of the Yangtze bend. 27° 45' N. 10,000 ft. July 1913. |
| 10553 | <i>P. Smithiana</i> , Bonati | On the hills to the east of the Lichiang Valley. 27° 15' N. 10,000 ft. July 1913. |
| 10597 | <i>P. Forrestiana</i> , Bonati | Chungtien Plateau. 27° 55' N. 12,000 ft. Fls. deep rose. July 1913. |
| 10604 | <i>P. aequibarbis</i> , Hand.-Mzt. | Chungtien Plateau. 27° 55' N. 11,000 ft. July 1913. |
| 10775 | <i>P. lutescens</i> , Franch.
var. <i>ramosa</i> , Bonati. | In marshy, stony pasture on the mountains in the N.E. of the Yangtze bend. 27° 45' N. 11-12,000 ft. Fls. yellow. August 1913. |

| | | |
|-------|--|---|
| 10776 | <i>P. Handel-Mazzettii</i> , Bonati | Chungtien Plateau. 27° 55' N. 12,000 ft. Fl. rose. August 1913. |
| 10789 | <i>P. rhodotricha</i> , Maxim. | Chungtien Plateau. 27° 55' N. 12,000 ft. Fl. soft rose. August 1913. |
| 10792 | <i>P. aequibarbis</i> , Hand.-Mzt. | Mountains in the N.E. of the Yangtze bend. 27° 45' N. 10,000 ft. August 1913. |
| 10801 | <i>P. dolichocymba</i> , Hand.-Mzt. (= <i>tristiformis</i> , m.) | In the N.E. of the Yangtze bend. 27° 45' N. 12,000 ft. August 1913. |
| 10805 | <i>P. Elwesii</i> , Hook. f. | Chungtien Plateau. 27° 55' N. 12,000 ft. Fl. bright rose. August 1913. |
| 10813 | <i>P. salviaeflora</i> , Franch. | On the T'ong Shan in the Yangtze bend. 27° 20' N. 8-9,000 ft. August 1913. |
| 10836 | <i>P. sigmoidea</i> , Franch. | On the T'ong Shan in the Yangtze bend. 27° 20' N. 10-11,000 ft. Fls. rose. August 1913. |
| 10838 | <i>P. tsekouensis</i> , Bonati | On the T'ong Shan in the Yangtze bend. 27° 20' N. 10,000 ft. Fls. pale yellow with just a touch of rose on helmet. Dry, open, stony pasture. August 1913. |
| 10870 | <i>P. Viali</i> , Franch. | On the T'ong Shan in the Yangtze bend. 27° 20' N. 10,000 ft. August 1913. |
| 10878 | <i>P. gracilis</i> , Wall. | On the T'ong Shan in the Yangtze bend. 27° 20' N. 10,000 ft. Fls. rose. August 1913. |
| 10896 | <i>P. trichoglossa</i> , Hook. f. | Chungtien Plateau. 27° 55' N. 12,000 ft. August 1913. |
| 10965 | <i>P. pseudo-melampyryflora</i> , Bonati | T'ong Shan, in the Yangtze bend. 27° 20' N. 10,000 ft. August 1913. |
| 10990 | <i>P. comptoniaefolia</i> , Franch. | On the margins of the thickets on the Yung-peh mountains. 26° 45' N. 9-10,000 ft. Fls. magenta rose. Sept. 1913. |
| 11040 | <i>P. rigida</i> , Franch. | Dry, stony pasture on the Yung-peh mountains. 26° 45' N. 9,000 ft. Fls. deep crimson. Sept. 1913. |
| 11160 | <i>P. yargongensis</i> , Bonati. | Chungtien Plateau. 27° 55' N. 9,000 ft. Sept. 1913. |
| 11194 | <i>P. comptoniaefolia</i> , Franch. | T'ong Shan (Yunnan). 27° 20' N. 10-11,000 ft. Sept. 1913. |
| 11560 | <i>P. deltoidea</i> , Franch. | Western flank of the Tali Range. 25° 40' N. 10,000 ft. Fls. rose. August 1913. |
| 11563 | <i>P. yunnanensis</i> , Franch. | Western flank of the Tali Range. 25° 40' N. 11-12,000 ft. Fls. magenta-rose. Sept. 1913. |
| 11693 | <i>P. polyphylla</i> , Franch. | Tali Range. 25° 40' N. 10,000 ft. August 1913. |
| 11769 | <i>P. polyphylla</i> , Franch. | Shweli-Salween divide. Moist, stony pasture. 25° 30' N. 9,000 ft. Fls. pale rose. Sept. 1913. |
| 11917 | <i>P. Henryi</i> , Maxim. | Shweli-Salween divide. 25° 20' N. 9,000 ft. Fls. red. August 1913. |
| 11969 | <i>P. humilis</i> , Bonati | Stony pasture on the Shweli-Salween divide. 25° 30' N. 10,000 ft. July 1913. |
| 12469 | <i>P. axillaris</i> , Franch. | On the Yangtze-Yungning divide. 27° 45' N. 10-11,000 ft. June 1914. |
| 12782 | <i>P. trichoglossa</i> , Hook. f. | N.W. flank of the Lichiang Range. 27° 25' N. 12,000 ft. Fls. deep crimson. July 1914. |
| 12873 | <i>Phthetiospermum auratum</i> , Bonati | In pine forests in the mountains of the Chungtien Plateau. 27° 30' N. 12,000 ft. July 1914. |

- 12974 *P. gyrorhyncha*, Franch. Kari Pass, Mekong-Yangtze divide. 27° 40' N. 10-11,000 ft. Fls. yellow, beak crimson. August 1914.
- 13026 *P. Viali*, Franch. Shady situations on the mountains of the Chungtien Plateau. 27° 30' N. 11,000 ft. Fls. pale rose. August 1914.
- 13028 *P. lutescens*, Franch. var. *brevifolia*, Bonati On stony pasture and in open pine forests on the N.W. flank of the Lichiang Range. 27° 30' N. 11,000 ft. 3-5 ins. Fls. pale yellow. August 1914.
- 13063 *P. rigida*, Franch. Mekong Valley. 27° 40' N. 9,000 ft. Fls. deep rose. August 1914.
- 13070 *P. kariensis*, Bonati Open, moist, stony pasture on the Kari Pass, Mekong-Yangtze divide. 27° 40' N. 13,000 ft. 2-3 ins. Fls. deep rose. August 1914.
- 13130 *P. Forrestiana*, Bonati Kari Pass, Mekong-Yangtze divide. 27° 40' N. 12,000 ft. August 1914.
- 13139 *P. dolichocymba*, Hand.-Mzt. var. On the Mekong-Yangtze divide. 27° 40' N. 12,000 ft. Fls. deep rose. August 1914.
- 13174 *P. dichotoma*, Bonati On the Bei-ma Shan, Mekong-Yangtze divide. 28° 20' N. 13,000 ft. 4-7 ins. Fls. light and dark rose. August 1914.
- 13187 *P. cranolôpha*, Maxim. var. *Garnieri*. Bei-ma Shan. Moist pasture. 28° 20' N. 12,000 ft. August 1914.
- 13222 *P. cymbalaria*, Bonati Moist, stony pasture on the Mekong-Salween divide. 28° 10' N. 13,000 ft. August 1914.
- 13294 *P. tsekouensis*, Bonati Moist, stony pasture on the Mekong-Salween divide. 28° 10' N. 13,000 ft. Fls. pale rose. Sept. 1914.
- 13390 *P. hirtella*, Franch. Open, stony pasture on the margins of pine forests, Mekong-Salween divide. 28° 10' N. 12,000 ft. Fls. creamy-yellow, flushed and tipped rose. Sept. 1914.
- 13462 *P. gyrorhyncha*, Franch. Amongst scrub on the Ghi Shan, east of Tali Lake. 25° 48' N. 9,000 ft. Fls. dull orange, with beak rose. August 1914.
- 14023 *P. Oederi*, Vahl Bei-ma Shan. 28° 12' N. 14,000 ft. Fls. pale yellow. June 1917.
- 14165 *P. rhinanthoides*, Schrenk. var. *labellata*, Jacq. mixed with *P. verbenae-folia*, Franch. Mekong-Salween divide. 28° 12' N. 9-10,000 ft. July 1917.
- 14200 *P. lucifuga*, Bonati On Ka-gwr-pw, Mekong-Salween divide. 28° 25' N. 10,000 ft. Fl. rose, beak darkest. Shady pasture on the margins of pine forests. July 1917.
- 14248 *P. cernua*, Bonati Mekong-Salween divide. 28° 12' N. 13,000 ft. Fls. pale rose, beak darkest. Moist alpine pasture. July 1917.
- 14367 *P. strobilacea*, Franch. var. *riparia*, Bonati Mekong-Salween divide. 28° 12' N. 13,000 ft. Fls. white or pale rose. Alpine meadows. July 1917.
- 14369 *P. Viali*, Franch. Ka-gwr-pw. 28° 25' N. 13,000 ft. July 1917.
- 14389 *P. dichotoma*, Bonati var. On the Bei-ma Shan. 28° 12' N. 14,000 ft. Fls. pale rose, beak crimson. July 1917.

| | | |
|---------|--|---|
| 14395 | <i>P. pseudo-Ingens</i> , Bonati. | On the Bei-ma Shan. 28° 12' N. 12-13,000 ft. Fls. rose, beak dark-est. July 1917. |
| 14405 | <i>P. Elwesti</i> , Hook. f. | On the Bei-ma-shan. 28° 12' N. 14-15,000 ft. Fls. rose. July 1917. |
| 14411 | <i>P. Bietii</i> , Franch. | On the Bei-ma Shan. 28° 12' N. 14-15,000 ft. Plant of 1 in. Fls. bright rose. Boggy pasture. July 1917. |
| 14431 | <i>P. rupicola</i> , Franch. | Mekong-Salween divide. 28° 12' N. 13,000 ft. Fls. rose. July 1917. |
| 14439 | <i>P. siphonantha</i> , D. Don | On Ka-gwr-pw, Mekong-Salween divide. 28° 25' N. 14,000 ft. July 1917. |
| 14468 | <i>P. rhinanthoides</i> , Schrenk
var. <i>labellata</i> , Jacq. | Mekong-Salween divide. 28° 12' N. 13,000 ft. Fls. rose. July 1917. |
| 14578 | <i>P. plicata</i> , Maxim. | Mekong-Salween divide. 28° 12' N. 12,000 ft. Fls. pale yellow. August 1917. |
| 14579 | <i>P. dolichocymba</i> , Hand.-Mzt. | Mekong-Salween divide. 28° 12' N. 13,000 ft. Fls. deep magenta-rose. August 1917. |
| 14581 | <i>P. strobilacea</i> , Franch.
var. <i>riparia</i> , Bonati. | Mekong-Salween divide. 28° 12' N. 13,000 ft. Fls. creamy-white, beak deep rose. July 1917. |
| 14582 | <i>P. cymbalaria</i> , Bonati | On Ka-gwr-pw, Mekong-Salween divide. 28° 30' N. 11,000 ft. August 1917. |
| 14588 | <i>P. rhodotricha</i> , Maxim. | Mekong-Salween divide. 28° 12' N. 14,000 ft. Aug. 1917. |
| 14648 | <i>P. Monbeigiana</i> , Bonati | Mekong-Salween divide. 28° 12' N. 12,000 ft. August 1917. |
| 14664 | <i>P. trichoglossa</i> , Hook. f. | Mekong-Salween divide. 28° 12' N. 12,000 ft. Fls. deep, soft rose. August 1917. |
| 14697 | <i>P. galeata</i> , Bonati | Mekong-Salween divide. 28° 12' N. 14,000 ft. Fls., base yellowish, apex and beak deep black-crimson. August 1917. |
| 14710 | <i>P. likiangensis</i> , Franch. | Mekong-Salween divide. 28° 12' N. Aug. 1917. |
| 16207 | <i>P. tribuloides</i> , Bonati. | Salween Valley. 28° 10' N. 10,000 ft. Margins of thickets by streams. 6-10 ins. Fls. rose. June 1917. |
| 16802 | <i>P. microchila</i> , Franch. | Mu-li mountains. 28° 12' N. 12,000 ft. Fls. deep rose. August 1918. |
| Monbeig | | |
| 39 | <i>P. tenuisecta</i> , Franch. | Tse-kou. 1912. |
| 52 | <i>P. verbenacifolia</i> , Franch. | Tse-kou. 1912. |
| 65 | <i>P. Lipskyana</i> , Bonati | Tse-kou. 1912. |
| 72 | <i>P. Monbeigiana</i> , Bonati | Tse-kou. 1912. |
| 78 | <i>P. likiangensis</i> , Franch. | Tse-kou. 1912. |
| Maire | | |
| 150 | <i>P. Labordei</i> , Vant. | Tong-Tchouan. 2600 m. juillet 1914. |
| 182 | <i>P. tachanensis</i> , Bonati | Marécages du Plateau de Ta-chan. 2200 m. Fls. roses. août 1914. |
| 191 | <i>P. salviaeflora</i> , Franch. | Pan-pien-kai. 2550 m. oct. 1914. |
| 192 | <i>P. gracilis</i> , Wall. | Pan-pien-kai. 2550 m. oct. 1914. |
| 195 | <i>P. alopecuroides</i> , Franch. | Tong-Tchouan. 2700 m. oct. 1914. |
| 216 | <i>P. phaceliaefolia</i> , Franch. | Lieux humides à Long-ky. 700 m. Fls. roses. août 1913. |
| 257 | <i>P. oxycarpa</i> , Franch. | Pan-pien-kai. 2700 m. sept. 1914. |
| 385 | <i>P. Mairei</i> , Bonati | Collines de Pi-ka-tang. 2700 m. oct. 1914. |
| 400 | <i>P. veronicifolia</i> , Franch. | Tong-Tchouan. 2550 m. oct. 1914. |

| | | |
|-----------------|---|--|
| 671 | <i>P. salviaeflora</i> , Franch. | Ma-kong. 2800 m. août 1913. |
| 672 | <i>P. dolichantha</i> , Bonati | Haut plateau de Ié-ma-tchouan.
3200 m. Fl. rose sombre. août
1913. |
| 673 | <i>P. praealta</i> , Bonati | Ié-ma-tchouan. 3200 m. Fl. jaunes.
août 1913. |
| 674 | <i>P. gracilis</i> , Wall. | Plateau de Ta-hai. 3200 m. août
1913. |
| 677 | <i>P. rex</i> , Clarke | Pou-long-tse. 2450 m. juillet, 1913. |
| 678 | <i>P. tahaiensis</i> , Bonati | Plateau de Ta-hai, 3200 m. Fl. rose.
juillet 1913. |
| 679 | <i>P. oxycarpa</i> , Franch. | Tong-tchouan. 2700 m. juillet 1913. |
| 680 | <i>P. densispica</i> , Franch. | Tong-tchouan. juillet 1913. |
| 681 | <i>P. gracilis</i> , Wall. | Pan-pien-kai. sept. 1913. |
| 682 | <i>P. salviaeflora</i> , Franch. | Tong-tchouan. 2700 m. sept. 1913. |
| 683 | <i>P. Mairei</i> , Bonati | Pan-pien-kai. collines calcaires.
2500 m. juillet 1913. |
| 684 | <i>P. comptoniaefolia</i> , Franch. | Coll. de Tcheou-Kia-tse-tang. 2550
m. sept. 1913. |
| 685 | <i>P. Labordei</i> , Vant. | Tong-tchouan. sept. 1913. |
| 686 | <i>P. Labordei</i> , Vant. | Tong-tchouan. sept. 1913. |
| 687 | <i>P. densispica</i> , Franch. | Ié-ma-tchouan. 3200 m. juillet 1913. |
| 688 | <i>P. dolichantha</i> , Bonati | Lagunes du Plateau de Ta-hai. 3200
m. Fl. roses. juillet 1913. |
| 689 | <i>P. veronicifolia</i> , Franch. | Tong-tchouan. 2550 m. sept. 1913. |
| 722 | <i>P. salviaeflora</i> , Franch. | La-kou. 2400 m. juillet 1913. |
| 891 | <i>P. densispica</i> , Franch. | Montagnes de Tong-tchouan. 2600
m. juin, 1914. |
| 1034 | <i>P. deltoidea</i> , Franch. | Pâturages du plateau de Ié-ma-
tchouan. 3200 m. août 1913. |
| 1061 | <i>P. densispica</i> , Franch. | Tong-tchouan. 2700 m. juin, 1913. |
| — | <i>P. Labordei</i> , Vant. | Tong-tchouan. 2700 m. Oct. |
| — | <i>P. oxycarpa</i> , Franch. | Tong-tchouan. 2700 m. Oct. |
| — | <i>P. tongtchouanensis</i> , Bonati | Tong-tchouan. 2700 m. Sept. |
| Ridley | | |
| 86 | <i>P. chinensis</i> , Maxim. | Kan-su. 1914. |
| Kingdon
Ward | | |
| 415 | <i>P. macrosiphon</i> , Franch. | A-tun-tsu. 1913. |
| 554 | <i>P. rex</i> , Clarke | A-tun-tsu. 13-14,000 ft. 1913. |
| 566 | <i>P. yunnanensis</i> , Franch. | A-tun-tsu. 7.6.1913. |
| 663 | <i>P. macrosiphon</i> , Franch. | Doker-la. 10-12,000 ft. 1913. |
| 683 | <i>P. strobilacea</i> , Franch.
var. <i>riparia</i> , Bonati | 11,000 ft. No locality. 4.7.1913. |
| 761 | <i>P. lachnoglossa</i> , Hook. f. | Doker-la. 13.7.1913. |
| 812A | <i>P. quadrata</i> , Bonati | Ka-gwr-pw. 15,500 ft. 1913. |
| 812B | <i>P. praeruptorum</i> , Bonati | Ka-gwr-pw. 15,500 ft. 1913. |
| 812C | <i>P. Elwesii</i> , Hook. f. | Ka-gwr-pw. 15,500 ft. 1913. |
| 818 | <i>P. lineata</i> , Franch. | Ka-gwr-pw. 15,500 ft. Precipices,
etc. 19.7.1913. |
| 828 | <i>P. Oederi</i> , Vahl
var. <i>sinensis</i> , Maxim. | Ka-gwr-pw. 15,500 ft. 20.7.1913. |
| 881 | <i>P. Wardii</i> , Bonati | Ka-gwr-pw Temple. 15,000 ft.
27.7.1913. |
| 935 | <i>P. lacerata</i> , Bonati. | A-tun-tsu. 13,000 ft. 2.8.1913. |
| 950 | <i>P. dichotoma</i> , Bonati
var. <i>Wardiana</i> , Bonati. | A-tun-tsu. 13,000 ft. 2.8.1913. |
| 974 | <i>P. dolichocymba</i> , Hand-
Mzt. | A-tun-tsu. 14,500 ft. 6.8.1913. |
| 987 | <i>P. superba</i> , Franch. | A-tun-tsu. 14,500 ft. 7.8.1913. |
| 989 | <i>P. trichoglossa</i> , Hook. f. | A-tun-tsu. 14,500 ft. 7.8.1913. |
| 1007 | <i>P. cymbalaria</i> , Bonati | A-tun-tsu. 15,000 ft. Aug. 1913. |
| 1052 | <i>P. Duclouxii</i> , Bonati | A-tun-tsu. 13-14,000 ft. 18.8.1913. |
| 1053 | <i>P. Viali</i> , Franch. | A-tun-tsu. 18.8.1913. |

| | | |
|-----------|---|--|
| 1070 | <i>P. dichotoma</i> , Bonati
var. <i>Wardiana</i> , Bonati | A-tun-tsu. 11,000 ft. 20.8.1913. |
| 1105 | <i>P. insignis</i> , Bonati | Doker-la. 14,000 ft. 1913. |
| 1692 | <i>P. taliensis</i> , Bonati | Hpimaw. 9-10,000 ft. 20.6.14. |
| 1744 | <i>P. taliensis</i> , Bonati | On granite in the forests. Hpimaw,
Upper Burma. Fl. pink. 8-10,000
ft. 6.7.1914. |
| 1802 | <i>P. multicaulis</i> , Bonati | Open screes, etc., Naung Chaung,
Nwai divide. Upper Burma. 12-
13,000 ft. 16.7.14. |
| 1881 | <i>P. gracilis</i> , Wall. | Hpimaw Pass. Open S-facing hill-
sides. 10,000 ft. 12.8.1914. |
| 1918 | <i>P. atra</i> , Bonati | Valley of the Naw-chaung. Upper
Burma. By streams in marshy
meadows. Fl. crimson. 28.8.1914. |
| 1919 | <i>P. Pantlingii</i> , Prain | Valley of the Naw-chaung. Upper
Burma. 28.8.1914. |
| 3253 | <i>P. siphonantha</i> , D. Don
var. <i>Hookeriana</i> | Laktang. Upper Burma. 26° 10' N.
8-9,000 ft. Colours the hills.
26.6.1919. |
| 3290 | <i>P. taliensis</i> , Bonati | Laktang. 26° 10' N. 8-11,000 ft.
Two vars. Fl. white and stems
pale, the other has crimson flowers
and dark stems. 29.6.1919. |
| 3293 | <i>P. laktangensis</i> , Bonati | With No. 3253. On granite. 26°
10' N. 9-10,000 ft. 30.6.1919. |
| 3380 | <i>P. siphonantha</i> , D. Don
var. <i>birmanica</i> | Imaw Bum. 12,000 ft. Fls. purple.
25.7.1919. |
| 3398 | <i>P. lineata</i> , Franch. | Imaw Bum. 13,000 ft. Fls. bright
crimson. 27.7.1919. |
| 3399 | <i>P. nobilis</i> , Bonati | Imaw Bum. 13,000 ft. Fls. bright
crimson, sometimes white.
27.7.1919. |
| 3400 | <i>P. cernua</i> , Bonati | Boulders on the giant's stairway.
N. face of Imaw. 13,000 ft. Fl.
pinkish-crimson. 27.7.1919. |
| 3440 | <i>P. multicaulis</i> , Bonati | Paijawng Bum. Upper Burma.
Facing N. at the summit. 12-
13,000 ft. 31.7.1919. |
| 3441 | <i>P. birmanica</i> , Bonati | Paijawng Bum. Upper Burma. 26°
10' N. 12-13,000 ft. Fl. bright
crimson. 31.7.1919. |
| 3457 | <i>P. gracilis</i> , Wall. | Laktang. Open meadows. S-fac-
ing slopes. 26° 10' N. 8-9,000 ft.
Fl. crimson. 3.8.1919. |
| 3572 | <i>P. Reynieri</i> , Bonati | Laktang. Upper Burma. 8,000 ft.
Fl. pale lemon-yellow, fading to
colourless in the tube. 25.8.1919. |
| 3581 | <i>P. pseudo-atra</i> , Bonati | Laktang. 9,000 ft. 27.8.1919. |
| 3605 | <i>P. Viali</i> , Franch. | Imaw Bum. Upper Burma. 11,000
ft. 2.9.1919. |
| R. Farrer | | |
| 1120 | <i>P. taliensis</i> , Bonati | Hpimaw. Upper Burma. 9-10,000
ft. Fl. pinkish. July 1919. |
| 1140 | <i>P. siphonantha</i> , D. Don
var. <i>birmanica</i> , Bonati. | Chimili Valley. 10,000 ft. July 1919. |
| 1141 | <i>P. taliensis</i> , Bonati | Chimili Woods. 10,000 ft. Fls. pale
pink. July 1919. |
| 1142 | <i>P. multicaulis</i> , Bonati | Chimili Valley. 11-12,000 ft. July
1919. |
| 1143 | <i>P. Pantlingii</i> , Prain
var. <i>chimilensis</i> , Bonati. | Chimili Woods. 10,000 ft. July 1919. |
| 1200 | <i>P. nobilis</i> , Bonati | Chimili Alps. 12,500 ft. August
1919. |
| 1204 | <i>P. Monbeigiana</i> , Bonati | Chimili Valley. 10,900 ft. August
1919. |
| 1216 | <i>P. Viali</i> , Franch. | Chimili Valley. 11,000 ft. Fl. pale
pink to whitish. August 1919. |

Schneider

- | | | |
|------|--|---|
| 1516 | <i>P. cephalantha</i> , Franch.
var. <i>szetchuanica</i> , Bonati | In pratis inter Hunka et Woloho.
3200 m. Szetchuan austral. Jun.
1913. |
| 1524 | <i>P. densispica</i> , Franch. | Szetchuan. Inter Hunka et Woloho.
2900-3200 m. Jun. 1913. |
| 1587 | <i>P. macrosiphon</i> , Franch. | Szetchuan austral. Inter Woloho et
Choso, in sylvis. 2900 m. Jun.
1913. |
| 1710 | <i>P. densispica</i> , Franch.
var. <i>Schneideri</i> , Bonati. | In pratis humidis, inter Yung-peh-
ting et Taowang. 2400 m. Jul.
1914. |
| 3763 | <i>P. cephalantha</i> , Franch.
var. <i>szetchuanica</i> , Bonati | In pratis inter Woloho et Humati.
2800 m. Jun. 1915. |

Clemens

- | | | |
|------|--------------------------------|---|
| 9080 | ? | Shansi. Sept. 1913. |
| 9082 | <i>P. Tatarinowii</i> , Maxim. | Tsu Yangh et Wutaishan (Shan-si)
Sept. 1913. |