

Additions to the Genus *Primula*.

BY

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I.

Through the courtesy of the Director of the United States National Herbarium, I have had the opportunity of examining a very extensive series of specimens of *Primula* and of *Omphalogramma* collected by Mr. J. F. Rock in Western China during the years 1928-9. The plants were secured chiefly in S.W. Szechuan, in the neighbourhood of what is known as the Muli Kingdom, but a certain number came from the Minya country lying to the south-west of Tatsienlu and some from N.W. Yunnan. Part of the area had not been previously explored—particularly the district running north-east from Muli in the direction of Tatsienlu. The collection, therefore, affords a valuable means of linking up the species of N.W. Yunnan and S.W. Szechuan with those likely to be obtained at no great distance from Tatsienlu. In number the specimens of *Primula* and of *Omphalogramma* come to 242—a very adequate assemblage and of excellent quality. I have found three new plants among them—fewer than I anticipated. This is perhaps an indication that the *Primula* flora of that region is within measure of being definitely enumerated, at least in so far as Szechuan is concerned. But the collection, apart from novelties, is of very special value as it provides material of several species which are far from adequately represented in any herbarium. It includes, for example, *P. aemula*, Balf. f. et Forrest, *P. amabilis*, Balf. f. et Forrest, *P. aromatica*, W. W. Sm. et Forrest, *P. blattariformis*, Franch., *P. cernua*, Franch., *P. fasciculata*, Balf. f. et Ward, *P. glacialis*, Franch., *P. gracilentia*, Dunn, *P. incisa*, Franch., *P. ingens*, W. W. Sm. et Forrest, *P. kialensis*, Franch., *P. leucochmoa*, Hand.-Mzt., *P. limbata*, Balf. f. et Forrest, *P. muliensis*, Hand.-Mzt., *P. orbicularis*, Hemsl., *P. Prattii*, Hemsl., *P. Purdomii*, Craib, *P. silaensis*, Petitm. and *P. violacea*, W. W. Sm. et Ward. Diagnoses of two new species and of a new variety follow.

***Primula chlorodryas*, W. W. Sm. Sp. nov.**

Affinis *P. dryadifoliae*, Franch. atque *P. chrysophyllae*, Balf. f. et Forrest a quibus habitu minore et floribus pallide flavidis differt.

[Notes, R.B.G., Edin., No. LXXIX, October 1931.]

Planta pulvinata rhizomate crassiusculo foliis siccis dense obtecto. Folia ad apicem rhizomatis numerosa congesta petiolo 5-6 mm. longo paulo alato praedita; lamina 8-10 mm. longa, 5-6 mm. lata, plus minusve ovata, apice basique rotundata, margine paulo recurvata leviter crenulata vel undulata, subtus luteo-farinosa. Scapi 1-4, graciles, flexuosi, 3-5 cm. alti, 1-3-flori, farinoso-pubescentes; bractee involucratae atropurpureae eis *P. chrysophyllae* subsimiles. Flores pallide flavidi, quoad formam eis *P. chrysophyllae* similes sed paulo minores.

"WEST CHINA. N.W. Yunnan: on Mount Fu-Chuan, southwest of Wei-Hsi, Mekong-Salween divide. On alpine limestone boulders. Flowers pale yellow. Alt. 4,450 metres. May-June, 1928." J. F. Rock No. 17027.

This is the first recorded instance of yellow flowers in the *Dryadifolia* Series. *P. chlorodryas* is a smaller plant than *P. dryadifolia* or *P. chrysophylla*. Like the latter plant it may be regarded as a subspecies of *P. dryadifolia*, Franch. *sensu lato*.

Primula Rockii, W. W. Sm. Sp. nov.

Species affinis *P. pulvinatae*, Balf. f. et Ward a qua petiolis praelongis, foliorum laminis late ovatis margine aliter incisus textura multo tenuioribus inter alia recedit.

Planta suffruticosa pulvinatim ramosa rhizomate lignoso elongato vestigiis foliorum siccis obtecto. Folia petiolo 2-6.5 cm. longo pilis longis pluricellularibus patentibus dense vestito praedita; lamina 1-3 cm. longa, 1-2.5 cm. lata, ambitu late ovata, apice obtusa, basi subcordata vel subtruncata, margine lobulato-incisa, lobulis iterum obtuse incisus, utrinque atque ad marginem longiuscule pubescens, pilis in foliis juvenilibus glandulosis, in sicco textura membranacea, supra haud rugosa, efarinosa. Scapus brevissimus, nunc vix evolutus nunc ad 6-7 mm. attingens, flores 1-5 gerens; bractee lineari-lanceolatae, 5-7 mm. longae, pubescentes; pedicelli circ. 2 cm. longi, in fructu ad 3 cm. elongati, pubescentes. Calyx tubuloso-campanulatus, ad 1 cm. longus, dense pubescens, ad medium in lobos lanceolatos subacutos fissus. Corollae luteae tubus circ. 1 cm. longus extra puberulus, limbus in sicco 2 cm. latus, lobis obcordatis emarginatis nunc erosulis minute ciliolatis. Stylus in flore brevistylo calycem aequans.

"WEST CHINA. S.W. Szechwan: in the mountains of Kulu, east of Muli Gomba. On limestone boulders. Flowers yellow. Alt. 3,650-4,425 metres. June, 1928." J. F. Rock No. 16451.

"West China. S.W. Szechwan: in the mountains of Muli and Kulu. On shady limestone cliffs. Flowers deep orange-yellow. Alt. 3,010 metres. April, 1929." J. F. Rock No. 17401. Also August, 1929. In fruit. No. 17402.

"West China. Mount Siga, north-east of Kulu. On limestone cliffs. Flowers yellow. Alt. 3,380 metres. June, 1929." J. F. Rock No. 17885.

This new species is one of the dwarfer members of the Section *Bullatae* and is akin to *P. pulvinata* and its allies. It is distinguished by the much more delicate texture of its leaves, by their ovate outline, by the very different indentation of the leaf-margins, by the very long petioles and by the absence of farina.

Primula stenocalyx, Maxim. var. *luteofarinosa*, W. W. Sm. Var. nov.

A planta typica foliis subtus luteofarinosis differt.

"WEST CHINA. S.W. Szechwan: on the Minya Konka Snow Range, south of Tatsienlu. On moist banks. Flowers purplish-blue. Alt. 4,660 metres. July, 1929." J. F. Rock No. 17520.

"West China. S.W. Szechwan: at Djesi-La and Djesi-Longba, south of Tatsienlu. Flowers bluish-purple. Alt. 4,600 metres. July, 1929." J. F. Rock No. 17549.

Copious collections made of *Primula stenocalyx* by Farrer in Kansu in 1915 and also by Rock in the same province in 1925 show that this species is very variable in the length of the pedicels, in the length of the calyx and in the presence or absence of farina on the underside of the leaves. Farrer referred to the efarinose form as *P. stenocalyx genuina* while that with white farina he designated *P. stenocalyx dealbata*. In this new variety coming from the south of Tatsienlu the farina is distinctly yellow but in other respects the plant is quite in accord with the Kansu specimens.

II.

In an enumeration of the species of the genus *Primula* in Notes Roy. Bot. Gard. Edin. xvi (1928), p. 33 appears *P. kweichouensis*, W. W. Sm. in the section *Obconica*, Balf. f. It is again referred to in Journ. Roy. Hort. Soc. liv (1929), p. 19. A description of this species has not been published and it has remained a *nomen nudum*. To rectify this omission a diagnosis is herewith appended.

Primula kweichouensis, W. W. Sm. Sp. nov.

Species affinis *P. barbicalyci*, C. H. Wright a qua foliis quoad texturam et indumentum et denticulationem valde diversis, calyce infra medium in lobos angustos diviso inter alia distinguitur.

Planta parva sectionis *Obconicae* atque ejus rhizomate praedita. Folia petiolo bene discreto 1-2.5 cm. longo pilis articulatis rubidis dense induto suffulta; lamina 2.5-4.5 cm. longa, 1.5-2.5 cm. lata late obcuneata vel nunc elliptica apice plerumque rotundata, basi

late cuneata vel rotundata margine remote denticulata, in sicco membranacea, supra glabra, infra ad costam venasque pilosa, ad margines pilis articulatis bene crinita. Pedunculi 1-3 stricti 2.5-3.5 cm. longi plerumque 3-flori, ut petioli induti; bractee lineari-lanceolatae 2-3 mm. longi; pedicelli 1-1.5 cm. longi rubido-pilosi. Flores in sicco albo-rosei 1.2-1.5 cm. longi. Calyx cupularis 3-4 mm. longus in lobos lanceolatos infra medium fissus pilis articulatis bene munitus. Corollae tubus gracilis fere 1 cm. longus, lobi obcordati emarginati. In flore brevistylo stylus calycem paulo superans. Fructus deest.

S.W. CHINA. Province of Kweichou. At Houang-ts'ao-pa. Jan., 1919. J. Cavalerie No. 4602.

Specimens are also in the herbaria of Kew and Vienna under this number. The ticket states that the specimen was collected in the Yunnan-sen district. I am indebted to Dr. Handel-Mazzetti of Vienna for the information that Houang-ts'ao-pa is in the province of Kweichou and not in Yunnan. *P. kweichouensis* is clearly a member of the *Obconica* series but has a peculiarly cut leaf, usually obcuneate. It is markedly distinct from the many forms of *P. obconica* coming nearest to *P. barbicalyx*, C. H. Wright. I have no information as to the nature of the habitat or the colour of the flower.

III.

PRIMULA PETELOTII, sp. nov.

Only one *Primula* has previously been recorded from Tonkin—*P. chapaensis*, Gagnep. in Bull. Soc. Bot. Fr. lxvi (1929), 139. This is figured in Fl. Génér. de L'Indo-Chine, iii, p. 755, fig. 85. It is a member of the section *Carolinella*. From the same mountain comes a second Tonkinese species obtained by the same collector whose name has been given to this new species. I am indebted to Professor Dr. L. Diels for the material on which the following description is based.

Primula Petelotii, W. W. Sm. Sp. nov.

Species sectionis *Petiolarium* atque subsectionis *Davidii*; ex affinitate *P. leptophyllae*, Craib a qua foliis chartaceis, pilis articulatis deficientibus inter alia differt; quoad ambitum foliorum una cum floribus bracteisque bene cum subsectione *Davidii* quadrat sed tamen in textura foliorum ad subsectionem *Chartaceam* spectat.

Rhizoma crassum, squamis basalibus cito deciduis. Folia omnia basalia petiolo 3-4.5 cm. longo bene discreto vix alato praedita; lamina late obovata vel nunc suborbicularis, apice bene rotundata, basi abrupte cuneata, in foliis majoribus 5-5.5 cm. longa, circ. 3 cm. lata, chartacea, margine subremote atque obtuse denticulata, dentibus

hydathodo terminatis, supra viridis infra olivacea, ut videtur efarinosa sed pagina utraque papillis farini-potentibus bene munita, pilis brevibus albidis furfuraceis utrinque conspersa, pilis longis articulatis omnino deficientibus, costa infra paulo eminente, nervis circ. 8 paribus cum nervulis reticulationem satis prominentem supra formantibus. Scapus non visus. Flores rosei, disjuncti tantum visi. Calyx cupularis, circ. 8 mm. longus, in fructu ad 10 mm. crescens, in sicco viridis, glaber vel pilis albidis furfuraceis sparsim notatus, lobis 2-3 mm. longis lanceolatis acutis integris vel nunc remote dentatis. Corollae glabrae tubus circ. 10 mm. longus, lobi obcordati, 7-8 mm. longi et lati, sinu lato emarginati. Stylus in flore longistylus fere ad os corollinum pertinens. Fructus deest.

TONKIN. On Mt. Chapa, at an elevation of 1,800 metres. Flowers rose. Feb. 1930. Coll. A. Petelot.

IV.

ADDITIONS TO THE PRIMULA FLORA OF NEPAL.

Among a series of plants recently collected in Nepal appear several Primulas. Of these two are new and are described below. Certain others are recorded for the first time from Nepal and are of interest from the point of view of distribution of the species. They are as follows:—

- P. Buryana**, Balf. f. Previously found only on the Mt. Everest expedition on the Tibetan side.
- P. cardiophylla**, Balf. f. et W. W. Sm. Previously from Sikkim. It is still an open question whether this species is the same as *P. rotundifolia*, Wall.
- P. crispa**, Balf. f. et W. W. Sm. Previously from Sikkim. This is, however, equivalent to *P. glomerata*, Pax recorded from Nepal and Tibet. Examination of Pax's types show clearly that *P. crispa* should be reduced to *P. glomerata*.
- P. glabra**, Klatt. Previously from Sikkim and Bhutan.
- P. gracilipes**, Craib. Previously from Sikkim.
- P. macrophylla**, Don var. *macrocarpa* (Watt). Previously from Sikkim, Tibet and Bhutan. The capsules of this moderate-sized Primula are the largest I have seen—in the Nepal specimens 3 cm. long.
- P. obliqua**, W. W. Sm. Previously from Sikkim and Bhutan.
- P. pudibunda**, W. W. Sm. Previously from Sikkim, Tibet and Bhutan.
- P. pulchra**, Watt. Previously only from Sikkim.

P. Wollastoni, Balf. f. Previously found only on the Mt. Everest expedition.

There can also be added as a Nepal plant, **Cortusa Matthioli**, L.

Primula didyma, W. W. Sm. Sp. nov.

Species valde affinis *P. reticulatae*, Wall., sed floribus purpureis nec flavis divergens; a *P. Waltoni*, Watt atque *P. prionotes*, Balf. f. et Watt, foliis submembranaceis basi cordatis nec decurrentibus inter alia distinguitur.

Planta circ. 30 cm. alta, facie *P. reticulatae*. Folia petiolo 7–12 cm. longo bene discreto haud alato suffulta; lamina 5–12 cm. longa, 2.5–4 cm. lata, apice rotundata, basi cordata vel subcordata, margine crebre denticulata, textura in sicco membranacea, glabra, farina albida minuta conspersa, reticulatione conspicua. Scapus circ. 30 cm. glaber, ad apicem obscure farinosus, circ. 6–10-florus; bracteae 4–6, circ. 1.5 cm. longae, lanceolatae, acuminatae, nunc apice serratae, virides, glabrae; pedicelli 1 cm. longi, nunc ad 6 cm. aucti, flexiles, leviter farinosi. Flores purpurei penduli. Calyx tubulosus, circ. 10 mm. longus, 3 mm. latus, ad quartam partem in lobos lanceolatos acutos fissus, leviter farinosus. Corolla quoad magnitudinem formamque cum ea *P. reticulatae* congruit. Fructus similiter.

"E. NEPAL. At Maney Dara; altitude 13–14,000 ft. Anno 1930." Coll. Major Lal Dhwoj. No. 453.

This plant is closely akin to *P. reticulata*, Wall. frequently collected in the Eastern Himalaya and always found to be yellow in colour of the corolla. It differs from *P. Waltoni* Watt markedly in its leaf-form and texture. It shows relationship with *P. rubra*, Ward which again has an entirely different leaf. Its exact position may be determined when it comes into flower in cultivation and it may have to be classed under *P. reticulata*, Wall. as a subspecies.

Primula nepalensis, W. W. Sm. Sp. nov.

Species sectionis *Petiolarium*, subsectionis *Roylei*; affinis *P. Griffithii*, Pax atque *P. Tanneri*, King a quibus floribus flavis nec purpureis inter alia differt.

Rhizoma breve sub anthesi squamis paleaceis pallide stramineis cinctum. Folia petiolo 4–9 cm. longo munita; lamina 8–11 cm. longa, 2.5–6 cm. lata, forma irregularis, nunc ovato-cordata, nunc oblanceolata, apice subrotundata vel obtusa, basi cordata vel late cuneata vel etiam anguste cuneata, margine grosse atque irregulariter dentata, in sicco membranacea, glabra, efarinosa, supra atroviridis minute albo-furfuraceo-maculata, subtus pallidior. Scapus circ. 24 cm. altus, subrobustus, 6–8-florus, apice subglaber vel nunc sparsim

farinosus; bractee sublineares circ. 1 cm. longae, basi ovatae, longissime acuminatae, pallide virides; pedicelli 1-2 cm. longi, sub-erecti, leviter farinosi. Calyx circ. 1 cm. longus, in sicco complanatus circ. 4 mm. latus, tubulosus, in lobos anguste lanceolatos acutos ad medium vel ultra fissus, farinosus (nonnunquam obscure). Corollae flavae fere 2 cm. longae tubus cylindricus circ. 1.2 cm. longus, limbus in sicco circ. 1.5 cm. latus minute (sub lente) puberulus, lobi anguste obovati emarginati. Stylus in flore longistylus paululo exsertus, in flore brevistylus ad medium tubum pertinens. Ovarium globosum. Fructus deest.

"E. NEPAL. At Goyan, 11-12,000 ft. Flowers yellow. Anno 1930." Coll. Major Lal Dhwoj. No. 18.

A species akin to *P. Tanneri*, King and *P. Griffithii*, Pax, showing the same irregularity in the shape of the leaves as in these species and in other Petiolarid Primulas. It differs from both the above species in the yellow colour of the corolla. In flower structure it is nearer to *P. Tanneri* than to *P. Griffithii*.

V.

ADDITIONS TO THE GENUS PRIMULA.

In the Report on the Fourth Primula Conference (1928) published in the Journal of the Royal Horticultural Society, liv, Pt. I, 1929, a list was given of the known species and subspecies of Primula. These were arranged in an approximately phyletic sequence and numbers were prefixed to each as a means of easy reference. It may be of service to record here such species as have been published since, to assign these their appropriate number in the list and to make certain modifications which have been found to be necessary.

- 18 *P. kisoana*, Miq. var. *shikokiana*, Makino in Journ. Jap. Botany, i, No. 6 (1917), 19.
- 18A *P. Hidakana*, Miyabe et Kudo, Hokkaido, Japan. Name only with photograph (as I am informed by Dr. Takeda) in Research Bull. Exper. Forest. Faculty of Agric., Hokkaido Imp. Univ. (1928). Allied probably to *P. kisoana*, Miq.
- 19A *P. Takedana*, Tatewaki in Journ. Jap. Botany, v, No. 8 (1928), 29. Hokkaido, Japan. Resembling *P. jesoana*, Miq. but slenderer and with pure white flowers.
- 25 *P. septemloba*, Franch. var. *minor*, Ward in Ann. of Bot. xlv (1930), 123. Mishmi Hills. Assam Frontier.
- 30A *P. Normaniana*, Ward in Ann. of Bot. xlv (1930), 123. Mishmi Hills. Assam Frontier. Allied to *P. vaginata*, Watt and *P. eucyclia*, W. W. Sm. et Forrest.

- 51 *P. flavicans*, Hand.-Mzt.

Dr. Handel-Mazzetti now considers that this is equivalent to *P. ambila*, Balf. f.

- 54 *P. kweichouensis*, W. W. Sm. in Notes Roy. Bot. Gard. Edin. xvi (1931), 225. S. China. Allied to *P. barbicalyx*, Wright and to *P. filipes*, Watt.

- 55 *P. subtropica*, Hand.-Mzt.

Dr. Handel-Mazzetti now considers this equivalent to *P. Vilmoriniana*, Petitm.

- 72A *P. chapaensis*, Gagnep. in Bull. Soc. Bot. France, lxxvi (1929), 139; also in Fl. Génér. Indo-Chine, iii, fasc. 6, p. 756 with Fig. 85. Tonkin. Allied to *P. Partschiana*, Pax.

- 77A *P. Ingwerseniana*, Harrison in "The Vasculum" xvi, No. 1 (1930), 6. Mt. Olympus, Balkan Peninsula. Near *P. balearica*, Willkomm.

- 87A *P. Lofthousei*, Harrison in "The Vasculum" xv, No. 2 (1929), 75. Sierra Nevada, Spain. Akin to *P. intricata*, Godr. et Gren.

P. hispanica, Willmott in Journ. Bot. lxvii (1929), 149 is described from the same area and is no doubt the same. Apparently *P. Lofthousei* is the slightly earlier name.

- 94A *P. legionensis*, Willmott in Journ. Bot. lxvii (1929), 150. Spain. Allied to *P. veris*, Linn.

- 154A *P. nepalensis*, W. W. Sm. in Notes Roy. Bot. Gard. Edin. xvi (1931), 228. Nepal. Akin to *P. Tanneri*, King.

- 161A *P. Petelotii*, W. W. Sm. in Notes Roy. Bot. Gard. Edin. xvi (1931), 226. Tonkin. Allied to *P. leptophylla*, Craib.

- 200A *P. Rockii*, W. W. Sm. in Notes Roy. Bot. Gard. Edin. xvi (1931), 224. Szechwan. Allied to *P. pulvinata*, Balf. f. et Ward.

- 204A *P. chlorodryas*, W. W. Sm. in Notes Roy. Bot. Gard. Edin. xvi (1931), 223. Yunnan. Closely allied to *P. dryadifolia*, Franch.

- 245A *P. Clutterbuckii*, Ward in Ann. of Bot. xlv (1930), 122. Mishmi Hills. Assam Frontier. Closely allied to *P. yunnanensis*, Franch.

- 252 *P. stenocalyx*, Maxim. var. *luteofarinosa*, W. W. Sm. in Notes Roy. Bot. Gard. Edin. xvi (1931), 225. Szechwan.

- 261 *P. Fauriei*, Franch. var. *samani-montana*, Tatewaki, in Research Bull. Exper. Forest. Faculty of Agric., Hokkaido Imp. Univ. (1928), 83.

262 **P. yuparensis**, Takeda.

Better regarded as a distinct species and not as a subspecies of *P. modesta*, Bisset et Moore. I am indebted to Dr. Takeda for material and for notes which make the position of this species quite clear.

305A **P. laciniata**, Pax et K. Hoffm.

Incorrectly reduced in Medd. Göteborgs Bot. Trädg. ii (1925-6), 110 to *P. incisa*, Franch. Also in Journ. R.H.S. liv (1929), 30. It is the same as Wilson 3147 collected in the same locality—near Tat-sien-lu. Its affinity is clearly with *P. gemmifera*, Batal. from which it differs in the much incised leaves.

336 **P. crispa**, Balf. f. et W. W. Sm.

This is the same as *P. glomerata*, Pax, which is the older name.

420A **P. mishmiensis**, Ward in Ann. of Bot. xliv (1930), 122. Mishmi Hills. Assam Frontier. Section Nivales. Allied to *P. calliantha*, Franch.421 **P. Agleniana**, Balf. f. et Forrest var. **atrocrocea**, Ward in Ann. of Bot. xliv (1930), 123. Mishmi Hills. Assam Frontier.

P. Agleniana, Balf. f. et Forrest var. **thearosa**, Ward in Ann. of Bot. xliv (1930), 122. Upper Burma.

470A **P. rubra**, Ward in Ann. of Bot. xliv (1930), 124. Mishmi Hills. Assam Frontier. Allied to *P. firmipes*, Balf. f. et Forrest.472A **P. deleiensis**, Ward in Ann. of Bot. xliv (1930), 124. Mishmi Hills. Assam Frontier. Perhaps a subspecies of *P. firmipes* Balf. f. et Forrest.473A **P. didyma**, W. W. Sm. in Notes Roy. Bot. Gard. Edin. xvi (1931), 228. Nepal. Closely allied to *P. reticulata*, Wall.484A **P. polonensis**, Ward in Ann. of Bot. xliv (1930), 124. Mishmi Hills. Assam Frontier. Allied to *P. Morsheadiana*, Ward.