

Fig. 6. Ovarium junius a latere visum.

6 a. Idem a facie postica visum.

7. Flos triandrus evolutus, antheris vacuis.

8. Flos tetrandrus. Capsula immatura filamentis marcidis stipata.

9. Stamina e flore triandro juniore extracta, flam. 2 monadelphis.

10. Staminodia.

11. Capsula matura.

12. Sectio transversalis pericarpium et placenta seminibus nudata.

13. Placenta semina 2 adhuc gerens. 14. Semen.

15. Embryo.

16. Capsula aperta, vacua.

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### Revision of the Genera and Species of Tulipeæ.

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IN this third paper on Liliaceæ I propose to monograph the caulescent capsular genera with free perianth-segments. Between the great mass of capsular polyphyllous Liliaceæ, a group which includes not less than between seven and eight hundred species, or two-thirds of the whole order if Asparagaceæ, Colchicaceæ and Smilacaceæ be excluded, there is very great uniformity in flower- and fruit-structure. The group now under consideration has never an introrse dehiscence of the anther, and in this respect recedes from typical Liliaceæ, as I intend to explain more fully further on; but leaving this out of view for the present, I may fairly say, by way of defining the tribe, that these capsular Liliaceæ with free perianth-segments fall readily, by character of rootstock and by general habit, into three great groups:—first, the scapose bulbs, as represented by *Scilla*, *Ornithogalum* and *Allium*; second, the Asphodels and Anthericeæ, with rootstocks fibrous only, not crowned with bulbs; and, third, the Tulipeæ, with bulbs and leafy stems. The only genus that is doubtful in position between the caulescent and acaulescent bulbous groups is *Gagea*, in which about half the species are, like *lutea*, strictly scapose and umbellate, with close leafy bracts from the base of the umbel, and the other half corymbose, with the bracts more or less remote from one another and the lowest arising from the stem distinctly below the branches of the inflorescence. It has a short basifixed anther, with lateral dehiscence, exactly like *Lloydia*; and although I have not included it now, on the ground that, if caulescent stems be made the chief character of the tribe, it is best excluded, yet I do this with the saving clause that, if anther-structure be made the chief test, it must be included in Tulipeæ, as was long ago

proposed by Bernhardt. These caulescent genera are the most showy of all the Liliaceæ; and as they include a large number of old garden-favourites, and are, as wild plants, restricted to north temperate regions, they might perhaps be expected to be well-known botanically. But the actual fact is quite the contrary. There are very few groups of flowering plants which have been so little investigated from a general point of view. *Lilium*, *Fritillaria*, *Tulipa*, *Calochortus*, and *Erythronium* are all genera in which the types are often so close to one another that it is necessary to examine them very carefully to separate species from one another, and in which a different plan of discriminating species makes a great difference in the number adopted. The latest general synopsis of the tribe is that contained in the fourth volume of Kunth's 'Enumeratio.' This is now thirty years old, and, even at the time of its publication, was badly adapted for determining unknown specimens, inasmuch as, though it is very full and complete as regards generic descriptions and as an index to the descriptions and figures of previous writers, yet in the book itself the species are usually characterized by brief diagnoses which are quoted from other authors without any effort being made to make them harmonize. A general monograph much better adapted for the determination of unknown specimens is that of the younger Schultes, contained in the sixth volume of the 'Systema Vegetabilium' of Roemer and Schultes, published in 1829, fourteen years earlier than Kunth. So that for the latest general handbook of the tribe we have now to go back for a full generation; and I need scarcely say that during the last thirty or forty years a great many new species have been discovered, principally in the Orient, Southern Siberia and California, and that a large amount of additional information about the characters and range of variation and geographical distribution of the old ones has been obtained, and that a great number of figures and detached descriptions have been published in local floras and the horticultural periodicals. At the present time we may fairly say that a general synopsis of this tribe, available for every-day working use, is one of the most pressing needs in species-botany. After going through a good supply of material both in the shape of living and dried specimens, I have found, as might be expected, very few new species to add, and a very large number of specific names in garden use either to cite as synonyms or place as varieties.

In these petaloid monocotyledons we may safely lay it down as a general rule that all descriptions not drawn up from living specimens are more or less unsatisfactory, so that a synopsis must of necessity be far more imperfect than in those orders in which herbarium specimens show the distinctive characters more clearly; and a good synopsis must be of gradual growth and the work of observers in different countries uniting together the result of their studies. As regards genera, it seems to me that we can arrange the plants of the tribe most naturally and grasp them the most readily by adhering substantially to the genera which Linnaeus laid down, adding only to his *Lilium*, *Fritillaria*, *Erythronium*, and *Tulipa*, *Calochortus* (with which he was unacquainted) and *Lloydia* (which he placed under *Anthericum*). If we do this we get four genera, *Lilium*, *Fritillaria*, *Tulipa*, and *Calochortus*, each clearly marked and popularly acknowledged, each containing from twenty to fifty species, and each with such a range of structure within its bounds that it might upon a narrower view of generic limitation be subdivided. The great want in the tribe now is, that the best and most natural subdivisions of genera should be established and defined, and the species properly classified under them. To this point little attention has as yet been directed; and as what I have to advance upon this head will be best seen from the detailed synopsis, it is needless to discuss the question in these preliminary general remarks.

Going through the organs seriatim, the following points are noteworthy:—

*Underground development.*—All the plants of the tribe are able in a state of nature or under cultivation to hold their ground, and increase more or less, by means of bulb-reproduction, independent of being multiplied by means of seed. In the structure of the bulbs of the tribe we may define four leading types:—

1. The squamose perennial bulb, as exemplified in all the Old-world species of *Lilium*. This consists, in its mature form, of a large number of thin flat lanceolate or oblong-lanceolate scales tightly pressed against one another face to back, and spirally arranged round a central axis which is not produced either vertically or horizontally. From the underside of the central axis proceeds downwards a dense tuft of fleshy fibres, and from the upperside is produced the flower-stem of the year, its lower part, between the summit of the bulb and the surface of the soil, giving off copious radicular fibres, which assist greatly in procuring the nourish-

ment and strengthening the hold upon the ground of the developed flower-bearing stem. This underground root-bearing portion of the stem above the bulb is often vertical, but in some species, as for instance *Lilium Leichtlinii*, will creep for a length of half a foot, so that, if grown in a pot and the bulb planted in its centre, the stem will spring up from the side of the pot. All these numerous flattened scales of the bulb possess potentially the power of developing new bulbs in their axils, and will do this, in some species at any rate, under cultivation, if a bulb be broken up and properly treated; so that what with bulb-reproduction and what with seed-reproduction, a skilful operator may in three or four years multiply fifty-fold his stock of a desirable species or variety. But in a state of nature there is only one new flower-bearing stem developed each season from the centre of the bulb, and a few from the axils of the decaying outer scales. A new bulb, whether grown from seed, or from bulblets developed in the axils of the above-ground leaves of the floriferous stem, or produced in the axil of one of the bulb-scales, takes not less than three years under the most favourable circumstances before it develops a flower-bearing stem. The first season we get an ovoid mass, perhaps a quarter of an inch in thickness, composed of half a dozen tightly imbricated scales, which sends out three or four slender radicular fibres from its base. At the end of next summer we have a bulb as large as a hazel nut, with a copious development of strong radicular fibres from its underside, and the half dozen scales prolonged above the soil into a rosette of oblanceolate leaves. Next year, if circumstances be favourable, the flower-bearing stem is developed; and then, if nothing untoward happens, the bulb goes on living for an indefinite period, sending out each year a flower-stem from its centre, and shredding off old scales with buds in their axils, more copiously in some kinds, less copiously in others, from the circumference all round. In two of the Californian lilies (*Washingtonianum* and *Humboldtii*) this type of structure is modified by the central axis of the bulb being prolonged horizontally, so that the scales are thrown out of a regular spiral, and the mature bulb is irregular in shape and more or less flattened laterally. Here, then, we get a squamose bulb taking the first step to pass off in the direction of a true rhizome; but the fleshy scales are quite similar to those of the typical form. The direction of the rhizome is vertically oblique, the new scales being formed at the deepest end. A second

modification of this type of structure I cannot do better than describe in the words of Duchartre ('Observations sur le genre *Lis*,' p. 28):—

“To give an idea of this development, allow me to report what I have seen in *Lilium canadense*, as examined at the commencement of the month of March, and in consequence at a time when only the first indications of the vegetation of the year were observable. At the base of the stem which had flowered the preceding year, and of which there remained only a small portion hidden in the ground, was found the bulb from which that stem had issued forth, a bulb formed of short scales, still fleshy and fresh for the most part, pointed and laxly imbricated, which, taken as a whole, was about twice as broad as deep. Immediately above this bulb was the remainder of the old stem, bearing a ring of root-fibres now dead and dried up. Finally the extreme base of this same old stem was prolonged below the bulb with a diameter nearly double that which it had above it; and after half an inch or more it ended by a broad truncation. It is from this old stem which has flowered in the preceding year, immediately below the old bulb, and very likely from the axil of a scale that has fallen, that the horizontal branch is originated, which at its extremity bears the new bulb from which the conical summit of the shoot which will soon develop into the flower-stem of the year is already seen to arise. This rhizome does not reach a length of more than an inch or an inch and a half. From its points of origin it descends a little into the soil, then raises itself to become horizontal, and finally rises at its extremity to form the axis of the new bulb and to be finally continued as the new flower-stem. In its underground progress it bears small spiral scales, thick and fleshy, of which the first are slightly spaced, but those at the end of this subterranean branch growing closer and larger and forming thus the new bulb. From the anterior portion of this rhizome, especially from the part that bears the lower part of the young bulb, arise numerous thickish rootlets, on the healthy action of which the vitality of the new vegetation evidently depends. Later on in the year the old bulb disappears, the horizontal rhizome thus becoming free. Then the rhizome dies in the part which does not produce rootlets; and at the same time a new rhizome arises from the base of the bulb of the year, to form in its turn at its extremity another bulb to yield the flower-stem of the year following. There are produced, then, in these Lilies a succession

of subterranean bulb-bearing branches, or a series of successive generations, each of which has an annual bulb for its fundamental basis."

In parting finally from this squamose type of structure\*, I wish to point out that there are three different kinds of "rhizome" in different species, developed in connexion with it, all of which are spoken of in books under the general term "rhizome," but which are not homologous, namely:—1st, the produced oblique central axis of the Californian Lilies; 2nd, the lower part of the horizontal branch originating from a bud developed in the axis of a leaf-scale, which branch at its extremity bears a new bulb, as in *Lilium canadense*; 3rd, the lowest part of the flower-bearing stem above the bulb when it creeps below the surface of the soil, as in *L. Leichtlinii*.

2. In most of the *Fritillariæ* we get a well-marked type of structure, for which I am not aware that any distinctive name has been proposed. Take the bulb of *Fritillaria Meleagris* at the flowering-season, and we find as follows:—in the centre the flower-producing stem, bearing from its base, but not above the bulb as in *Lilium*, a tuft of slender radicular fibres. Tightly pressed against the base of the flower-stem are a couple of hemispherical scales, not thin and flat as in *Lilium*, but half as thick as broad (say half an inch broad and a quarter of an inch thick), rounded on the outside, flat on the inside, where they are pressed against one another and the base of the flower-stem. These are the bases of single leaves, homogeneous, not at all laminated in structure. From the summit of each, before the development of the flower-stem, arises an oblanceolate leaf which dies down before the flower is produced. In the autumn these two scales produce in their axils buds in the same way as in *Lilium*, one of which produces the flower-stem of the following year; and on the outside they are wrapped in two or three thin membranous tunics, which have never produced leaves or fulfilled any nutritive function. This type of structure is scarcely varied through about half the genus *Fritillaria*; and it is this type that is distinguished in the synopsis of the genus as a tunicated bulb. But in the American *Fritillariæ* there are no outside tunics, and the scales are numerous, not large and flattened as *Lilium*, but small granules as thick as wide. Upon this difference Dr. Kellogg has

\* See also Royer in 'Bulletin Soc. Bot. France,' tome xix. p. 157, and Duchartre's remarks in the same volume, p. 159.

proposed to separate the American Fritillaries as a genus under the name of *Liliorhiza*; but there is no difference in flower-structure between the Old-World and the New-World species, whilst the bulb of the New-World *pudica* is sometimes barely distinguishable from those of the *Meleagris* group; and we get the *Liliorhiza* type represented in Asia in *F. kamchatcensis*; and in the Old-World *F. imperialis* and *persica*, which were classed as Lilies by the pre-Linnean authors, we get a large perennial squamose bulb without any tunic, not materially different in any way from that of *Lilium*, with the scales as thin, but not so regularly formed, and broader at the base. So that it will be seen that *Fritillaria*, which has been little studied from this point of view presents great variety and much interest in its bulb-structure, and runs over the line of transition which separates the squamose from the tunicated type. In Gen. Fl. Germ. there is a figure, for *F. pyrenaica*, of an accessory bulb at the end of a horizontal elongated stolon, as is frequent in the tulips.

3. The third type of structure, an annual laminated tunicated bulb, runs, with much modification as regards the number and thickness of the laminae and the texture and persistence of the tunics, through *Tulipa*, *Calochortus*, and *Lloydia*. In all these, radicular fibres are developed from the stem on the underside of the bulb only, and at the end of the flowering-season the old stem may be traced down to its base quite slender and cylindrical, with all the nutriment absorbed from the leaf-bases that have nourished it; and outside of it, within the same external tunic, stands the bulb well developed, which is to bear the flower-stem of the following year. In *Tulipa* the outer tunics are brown and leathery, the inner tunics several in number and so thick that the bulb is broad-ovoid in shape; and by the side of the old stick-like stem and well-developed bulb that is to flower next year, may be traced the nascent bulb of the year following, so that the bulbs are in their third year when they reach the flowering-stage. The subordinate bulbs thrown out from the base of the old ones are often lengthened out upon rhizomes; and it is this that is meant in the synopsis when the bulbs are said to be stoloniferous; and it is upon the difference whether these accessory bulbs are sessile or stalked that the distinction between Rebol and Parlatore's "Tulipæ gregariæ" and "Tulipæ erraticæ" depends. In *Calochortus* the structure is similar to that of *Tulipa*; but the inner tunics are fewer, and the outer thinner. In the Mexican species

of *Calochotrus* the outer dry coats form a dense mass of reticulated fibres mixed with little cellular tissue, like those of *Crocus vernus* and *reticulatus*. In *Lloydia serotina* the outer coats are thin, grey, and membranous, and the inner coats so little thickened that the bulbous dilatation at the base of the stem is very slight; and we thus get an oblique rhizome-like bulb similar to those of *Allium* and *Rhiziridium*. But the essential structure, which has been fully illustrated by Wydler \*, Irmisch †, and Michalet ‡, is identical with that of *Tulipa*; and it is said that, owing to the thinness and dryness of the tunics, and the high alpine stations in which the plant grows, by careful dissection its history may be traced out for eight or ten years. Here it has been clearly shown that the accessory basal bulbs are sometimes sessile and sometimes stalked, in one and the same species, according to circumstances.

4. In the section *Gageopsis* of *Lloydia* we have a fourth modification of structure, a tunicated corm. Here, as in *Gagea*, the floriferous stem is nursed and nourished by the modified base of a single leaf, which leaf is fresh and green at the time that the floriferous stem is developed, springing of course from the tip of the corm, whilst the stem arises close to it from a little on one side of the corm. In some species of *Gagea* the nascent corm of the year following may be seen protruded from the side of the old corm at the flowering-time, already bearing a well-developed leaf. This is in the two-leaved species, like *G. arvensis*. In some other species it may be seen at the flowering-time, but does not grow out into a leaf; and in some others, as in our English *G. lutea*, it is invisible at the flowering-time; and these have always a solitary leaf. In *Erythronium* also the flower-stem is nursed by the much thickened base of a single leaf. In a newly discovered American species a very remarkable kind of rhizome has lately been figured and described by Dr. Asa Gray §. The corms are nearly half a foot deep; and a lateral offset springs from the base of the stem near the surface of the soil about midway between the corm and apparent bases of the solitary opposite pair of leaves. This offset works downwards, sometimes remaining

\* 'Regensburg Flora,' 1859, pp. 33-36.

† Mohl and Schlecht. 'Bot. Zeit.' 1863, pp. 161-4 and 169-173, tab. 6, with 29 analytical figures.

‡ 'Bulletin Soc. Bot. France,' vii. p. 676.

§ 'American Naturalist,' July 1871.



short, sometimes lengthening out; and its apex dilates into a new corm.

To sum up the bulb-structure of the tribe, the two main points of interest are:—

1st. That throughout the tribe the bulbs are strictly determinate and monocarpic, the main axis elongating into a flower-bearing stem, and the bulb, the cycle of existence of which is from one to three years, either dying or remaining, but in either case developing a new bulb in the axil of one of its scales. In what is called in the synopsis a perennial squamose bulb the old scales remain and a new bulb is developed into a flower-stem in their centre; in the third and fourth types the old scale or scales die, and the new floriferous stem is developed outside them.

2nd. We get in the tribe, side by side with a general uniformity in flower-structure, every range of transition from a typical squamose bulb, through a typical tunicated bulb, to a tunicated corm, the differences between them depending upon the breadth and thickness of the enlarged bases of the leaves, their duration, their uniformity or difference in texture, and whether they all or some only grow out to produce leaves above ground, and whether some only or all are dilated below the surface into reservoirs of nutriment.

*Bulbillæ*.—Bulblets quite similar in structure to those produced in the axils of the underground leaves are regularly present in the axils of some of the leaves of the stem in *Lilium bulbiferum* and *tigrinum*, in *Fritillaria macrophylla*, and in the Mexican species of *Calochortus*, and are occasionally developed in some of the other Lilies if the inflorescence be injured.

*Leaves*.—The leaves are mostly linear, sessile, with close parallel ribs of the most characteristic Endogenous type. In *Calochortus* they are always very narrow and more grass-like in texture than in the other genera except *Lloydia*. In *Tulipa* they are quite characteristic, lorate or lanceolate, with a very fleshy texture and a glaucous tinge. *Erythronium* has always a single pair of broad amplexicaul leaves opposite to one another, placed near the base of the above-ground part of the stem. Throughout *Fritillaria* the leaves are always sessile and narrow; in a few species they have peculiar cirrose tips. In *Lilium* there is more variety, the oblanceolate *Martagon* type, sessile, thin in texture, with lax subreticulated veining, being shown in several species. In *L. speciosum* and *auratum* there are short petioles that clasp the

stem. But by far the most remarkable deviation in the tribe is in the section *Cardiocrinum*, which has long clasping petioles, and very large broad leaves with a deep cordate base and reticulated nervation. In both *Lilium* and *Fritillaria* there is great variety in the way of opposition or alternation of the leaves. In a few *Fritillarias* and many *Liliums* the leaves are normally in regular whorls; but in *Lilium* the whorls are often, some or all of them, broken up; so that even as a specific character this verticillation needs to be used with caution.

*Inflorescence*.—The flowers are either solitary, or few or many arranged in centripetal racemes, which have a tendency under cultivation or injury to be congested into umbels. The Crown Imperial only is typically umbellate, with a corona of many bracts. The bracts are always simply reduced leaves, green, and little changed in character, and never in this tribe become membranous or spathe-like.

*Perianth-form and colouring*.—*Calochortus* recedes conspicuously from typical Liliacæ by having the three outer segments of the perianth sepaloid in texture and lengthened out into points, whilst the three inner divisions are petaloid, generally deltoid, as broad as deep, and rounded on the outer border. The only other *Liliaceous* genus which thus takes on the *Bromeliaceous* character is *Xanthorrhæa*, which is very different in every other respect. By the character of a marcescent, as opposed to a deciduous perianth, we get *Lloydia* and *Erythronium* on one side, the other four genera on the other. Excluding *Calochortus*, the difference in shape between the outer and inner segments is generally but slight; it is most conspicuous in some of the Tulips, in which the inner segments are blunt and the outer acute. The general shape of the perianth marks off *Erythronium* clearly and *Lilium* less clearly from the rest, and in *Lilium* furnishes one of the best characters for the subordinate groups. The great genera are usually distinguishable at a glance by the colouring of the flowers—the blue-black basal blotches of the Tulips, the tessellation of the Fritillaries, and the minute brownish dots passing into papillæ of the Lilies being in each case quite characteristic, but by no means extending to every species of the genus.

*Nectary*.—All the other genera except *Tulipa* and *Erythronium* show some kind of a greenish glandular pit or carinal groove; but only in *Calochortus* does it extend quite through the genus. In all of them the absence or presence of this nectary, its variation

in form, and the vestiture of its surface and edges furnish good characters to mark groups and species. Unfortunately it is one of the characters of the flower that suffers most in the process of drying. Except in the case of a single Fritillary, the presence of prominent ridges and papillæ on the lower part of the face of the perianth-segments, is peculiar to *Lilium*; and there its presence or absence helps to mark the sections.

*Stamens*.—There is no conspicuous irregularity in the stamens throughout the tribe, the six anthers being always perfect and the filaments nearly equal in length and on a level as regards insertion. The filaments are either strictly hypogynous or adhere but faintly to the base of the perianth-segments. They are always uniform in shape, and never flattened out into petaloid processes. The anther is never properly introrse, but slits down the edges. In *Tulipa*, *Calochortus*, *Erythronium*, and *Lloydia* the anthers are strictly basifixed, being deeply excavated at the base to receive the narrowed point of the filament. In the three first-named genera they are long and narrow; in *Lloydia* very small and so short as to be nearly globular, just as in *Gagea*. In *Lilium* the long lightly poised anther is attached by its centre to the filament on the side nearest the middle of the flower, just as in *Colchicum*; *Fritillaria* comes midway between *Tulipa* and *Lilium*, the anthers in the *Meleagris* group appearing in an early stage as if basifixed, as, indeed, they were described by Bernhardt, but being seen later on to be slightly versatile, with the filament fastened a little above the base of the connective on the side nearest the middle of the flower. And in the small Indian section *Notholirion* the versatility is as clearly marked as in *Lilium*.

*Style and Stigma*.—In *Calochortus* the style is invariably absent. I have ventured to unite *Orithyia* to *Tulipa*, with which it completely agrees except in the presence of a short style. In *Lilium*, as here defined, the thick rather clavate style with a large three-lobed stigmatic knob at the end is quite characteristic and uniform. In *Fritillaria* we get every transition between an entire and deeply three-cleft style combined with great uniformity in other points; and just the same thing holds good for the small genus *Erythronium*. But in both these the dehiscence of the capsule is loculicidal, and the style never cleft down to the base.

*Capsule and seeds*.—Both in the septicidal dehiscence of its capsule and the character of its seeds *Calochortus* recedes conspicuously from all the other genera, containing within its bounds

a wide difference in capsule-shape. The other three large genera, *Tulipa*, *Lilium*, and *Fritillaria* resemble one another closely both in capsule and seed. They all have tightly packed discoid narrowly bordered seeds with brown testas, and large obovoid capsules with a distinct neck and loculicidal dehiscence, the splitting valves being connected with a network of slender fibres, which Salisbury called vibrissæ, which are characteristic of these three genera. *Erythronium* and *Lloydia* have small loculicidal capsules without vibrissæ, the seeds of both being few in number and characteristic in shape—in the first turgid with a peculiar caudicle, and in the latter narrow and three-angled.

*Sources consulted.*—Besides the various London collections, as explained in my former paper, I have gone through, for this tribe, the herbarium of Lindley at Cambridge, and have been lately favoured with the loan of that of M. DeCandolle, which contains a suite of authenticated examples of Reboul's Tulips, and several other things which we do not possess in this country. For living plants I relied, in the first instance, upon the gardens of Kew and Mr. Wilson Saunders. Beside these I have been greatly indebted to Mr. Barr, of Tooting, whose extensive collection of bulbs, a large stock of each species and variety, I have gone through at different seasons, and who has been most kind in giving and sending me flowers and bulbs for leisurely examination at home. For Lilies I am under great obligation to Max. Leichtlin, Esq., of Carlsruhe, who, as is well known, has made a speciality of the genus for many years, and been the principal agent in bringing back these beautiful plants to their present height of popularity. He brought over for the use of this paper his extensive collection of oil-paintings of his favourites, and has given me a series of detailed notes upon the bulb- and capsule-characters of the cultivated species; and in respect of species-limitation I have, to a very large extent, been guided by his opinions and suggestions.

*On the relation of Liliaceæ to Colchicaceæ.*—In noticing a former paper of mine\*, Dr. Gray took me to task for incidentally exaggerating the strength or straightness of the line of demarcation between Liliaceæ and Colchicaceæ; and I recur now to the matter to say that it is impossible to go through the Tulipeæ without feeling how difficult it is to draw the line between them.

\* 'Silliman's Journal,' 2nd series, vol. 50, p. 127.

Taking the best characters of distinction between the typical genera of the two supposed orders, we may fairly state them as follows:—

<i>Liliaceæ.</i>	<i>Colchicaceæ.</i>
1. Anthers introrse.	Anthers extrorse.
2. Styles united.	Styles separated.
3. Capsules loculicidal.	Capsules septicidal.

If we take the genera of Tulipeæ, we find for the first point that none of them has properly introrse anthers, and that in *Lilium* itself the structure is identical with that of *Colchicum*, and that in *Fritillaria* also the slit is down the side, and the attachment of the filament is on the side of the anther nearest the middle of the flower. Take the second point, and both *Fritillaria* and *Erythronium* recede from the Liliaceous type, whilst *Calochortus* does not show any one of three Liliaceous characters. Between *Uvulariæ* on the one hand and Tulipeæ and *Asparagæ* on the other, the line is very difficult to draw. *Uvularia* itself has basifixed anthers slitting down the edge, a loculicidal capsule, a deeply three-cleft style and a creeping rootstock. *Gloriosa* has a similar capsule and style, with versatile anthers attached on the inner side, and a large deeply lobed corm. These latter genera, with one or two others, will best form a group parallel with Tulipeæ in the non-bulbous series. For the exceptional genera classed with *Colchicaceæ* I refer those interested to Dr. Gray's note; and I am now quite satisfied that there are so many exceptions to the separating characters on both sides, that it is best to join them in one and the same Order.

*Geographical distribution.*—In the synopsis, counting several acknowledged garden hybrids, 179 species are admitted. Arranging the six genera according to size, they are as follows:—

<i>Fritillaria</i> .....	55 species.
<i>Tulipa</i> .....	48 „
<i>Lilium</i> .....	46 „
<i>Calochortus</i> .....	21 „
<i>Erythronium</i> .....	5 „
<i>Lloydia</i> .....	4 „

Taking the tribe as a whole, it is spread throughout the North Temperate zone, agreeing in this respect with *Alliæ*, but contrasting with most of the other tribes of *Liliaceæ*, several of which

are half, and one (Aloineæ) almost entirely Cape. Only one species, *Lloydia serotina*, is really boreal or Alpine. The south limits of the tribe are Mexico, the Philippines, South China, the Neilgherries, and the southern border of the Mediterranean. Nearly all the species are hardy in our London gardens. The principal concentration of species is in California and Japan. Taking the genera one by one, *Lilium* and *Fritillaria* have the distribution of the tribe; but passing from Asia to America, the latter stops short at the Rocky Mountains, whilst several of the Lilies reach the Atlantic seaboard. As already explained, the Old-World species usually differ from those of the New World in their bulbs. *Tulipa* is restricted to the Old World, reaching from Spain, Britain, and Scandinavia to Japan and the Himalayas. *Calochortus* is confined to Mexico and the west side of the Rocky Mountains, as if supplementing *Tulipa*. Of the five species of *Erythronium*, one is confined to the Old World and four to the New. *Lloydia* § *Gageopsis*, with three species, is Oriental and Siberian. *Lloydia serotina* is the most widely spread of all the Liliaceæ, and a unique instance of a petaloid monocotyledon of the north temperate zone with almost universal high-mountain and arctic distribution.

Tribus TULIPÆÆ. Herbæ bulbosæ caulescentes, perianthii segmentis liberis, antheris secus margines dehiscentibus. \*

#### CLAVIS GENERUM.

\* *Capsula loculicide trivalvis. Segmenta perianthii conformia.*

1. LILIUM. Perianthium deciduum segmentis patentibus albis vel splendide coloratis sæpissime punctato-papillois unguibus foveola lineari præditis. Stamina leviter perigyna, antheris valde versatilibus. Stylus elongatus indivisus. Semina multa discoidea. *Orbis totius reg. temp. bor.*
2. FRITILLARIA. Perianthium deciduum, segmentis vix vel leviter falcatis, sæpissime vinoso-purpureis tessellatis, supra basin foveola brevi præditis. Stamina leviter perigyna, antheris obscure versatilibus. Stylus elongatus gracilis tricuspidatus vel indivisus. Semina multa discoidea. *Orbis totius reg. temp. bor. Amer. or. excl.*
3. TULIPA. Perianthium deciduum, splendide coloratum, diutine campanulatum, nunquam punctatum nec tessellatum. Stamina hypogyna antheris basifixis. Stylus sæpissime nullus. Semina multa discoidea. *Orbis veteris reg. temp. bor.*

4. **ERYTHRONIUM.** Perianthium marcescens, segmentis arcute revolutis. Antheræ elongatæ basifixæ. Semina pauca turgida strophiolata. *Orbis totius reg. temp. bor.*
5. **LLOYDIA.** Perianthium marcescens, segmentis diutine ascendentibus. Antheræ parvæ basifixæ. Semina pauca angusta triquetra. *Orbis totius reg. temp. bor.*
- \*\* Capsula septicide trivalvis. Segmenta exteriora sepaloidæa.**
6. **CALOCHORTUS.** Genus solum. *Mexico et Am. bor. occid.*

## 1. LILIUM, Linn.

*Gen.* 410; *Endl. Gen.* 1090; *Schultes, fl. Syst.* vii. xxxi et 399; *Kunth, Enum.* iv. 256 et 673; *Spæ, Mémoire sur les espèces du genre Lis, in Mém. Acad. Brux.* vol. xix. (1847); *Duchartre, in Journ. Imp. Hort. France*, vols. iv. & v. (1870-1); *K. Koch, Wochen.* 1870; *Baker, Gard. Chron.* 1871; *Journ. Hort. Soc. Lond. new series*, iv. 39.—*Martagon (Rupp.), Salisb. Gen.* 56.

*Perianthium* corollinum deciduum 6-partitum infundibuliforme, segmentis æqualibus oblanceolatis flore expanso plus minus falcatis facie lævibus vel lamellato-punctatis, albis vel splendide flavis vel rubris, nunquam tessellatis, unguibus sulco nectarifero lineari distincto vel interdum obsoleto præditis. *Stamina* 6 æqualia obscure perigyna inclusa, filamentis elongatis filiformibus vel leviter complanatis plus minusve declinatis, antheris versatilibus medio dorsi introrsum affixis, secus margines totas dehiscentibus. *Ovarium* sessile cylindricum triloculare, ovulis in loculo crebris horizontalibus; *stylus* clavatus plus minus declinatus, ovario sæpissime longior, apice stigmatoso rotundato trilobato. *Capsula* coriacea obovoidea 6-angulata loculicide trivalvis, seminibus crebris discoideis marginatis, testa brunnea membranacea.—*Herbæ zonæ temperatæ borealis utriusque orbis, bulbis squamosis, foliis pluribus sparsis vel verticillatis, floribus racemosis vel solitariis speciosis æstivis.*

Subgenus I. **CARDIOCRINUM.** *Perianthium infundibuliforme segmentis oblanceolatis apice solum falcatis. Folia petiolata cordato-ovata.*

1. *cordifolium.*2. *giganteum.*

Subgenus II. **EULIRION.** *Perianthium infundibuliforme segmen-*

*tis oblanceolatis apice solum falcatis. Folia linearia vel lanceolata sessilia vel subsessilia.*

Tubus ex basi ad medium vix ampliatus.

3. *philippense.* 4. *Wallichianum.* 5. *longiflorum.*  
6. *neilgherrense.*

Tubus ex basi ad collum sensim ampliatus.

Folia sparsa :—

7. *japonicum.* 8. *Krameri.* 9. *nepalense.* 10. *candidum.*  
11. *Belladonna.*

Folia verticillata :—

12. *Washingtonianum.*

Subgenus III. ARCHELIRION. *Perianthium apertum infundibuliforme, segmentis infra medium latissimis profunde patentibus. Stamina ab stylo declinato divergentia.*

Folia sessilia :—

13. *tigrinum.* 14. *oxypetalum.*

Folia breviter petiolata :—

15. *speciosum.* 16. *auratum.*

Subgenus IV. ISOLTRION. *Perianthium erectum, segmentis flore expanso falcatis, haud revolutis. Stamina ab stylo recto undique divergentia.*

Folia verticillata :—

17. *philadelphicum.* 18. *medeoloides.*

Folia sparsa; stylus ovario brevior :—

19. *concolor.*

Folia sparsa; stylus ovario longior :—

20. *bulbiferum.* 21. *croceum.* 22. *davuricum.* 23. *elegans.*  
24. *Catesbæi.*

Subgenus V. MARTAGON. *Perianthium cernuum, segmentis valde revolutis. Stamina ab stylo declinato undique divergentia.*

Folia verticillata.

Americanæ.

Bulbi annui rhizomatiferi :—

25. *canadense.* 26. *pardalinum.* 27. *superbum.* 28. *Roezlei.*

Bulbi perennes haud rhizomatiferi :—

29. *columbianum.* 30. *Humboldtii.*

Gerontogæ :

31. *Martagon.* 32. *avenaceum.* 33. *Hansoni.*



Folia sparsa.

Folia lanceolata multinervata.

Perianthium supra medium falcatum :—

34. *monadelphum*.

Perianthium infra medium revolutum :—

35. *polyphyllum*. 36. *ponticum*. 37. *carniolicum*.

Folia anguste linearia uni- vel paucinervata.

Segmenta perianthii medio 6-12 lin. lata :—

33. *testaceum*. 39. *Leichtlinii*. 40. *pseudo-tigrinum*.

Segmenta perianthii medio 3-6 lin. lata :—

41. *pomponium*. 42. *chalconicum*. 43. *callosum*.

44. *tenuifolium*.

§ CARDIOCRINUM (Endl.). *Perianthium* infundibuliforme, segmentis oblanceolatis longe unguiculatis, flore expanso apice solum falcatis intus haud papillosis, foveola carinali haud excavata. *Stamina* cum stylo parallela leviter declinata. *Folia* cordato-ovata reticulato-venosa longe petiolata. Ab stirpibus reliquis differt foliis Smilacoideis.

1. *L. CORDIFOLIUM*, *Thunb. Linn. Trans.* ii. 332; *Schult. fl. Syst.* vii. 420; *Sieb. et Zucc. Flor. Jap. fusc.* iii. 33, t. 13. fig. 2 et 14; *Kunth, Enum.* iv. 268; *Miquel, Ann. Mus. Lug. Bat.* iii. 157.—*Saussurea cordifolia*, *Salisb. Linn. Trans.* viii. 11.—*Hemerocallis cordata*, *Thunb. Fl. Jap.* 143; *Gaertn. Fruct.* ii. 484, tab. 179, fig. 5. Bulbus ei *gigantei* omnino similis, sed minor, squamis crassioribus rugosioribus minus regularibus. Caulis 3-4-pedalis, pede infimo nudo, foliis primum in rosulam congestis. Folia primordially sanguineo tineta, caulina ovata profunde cordata longe petiolata. Racemus in exemplis visis 4-10-florus vix pedalis, expansus 9-14 poll. latus, pedicellis floriferis patentibus 3-8 lin. longis, bracteis ovatis acutis caducis. Perianthium anguste infundibuliforme 4-6 poll. longum, tubo e basi 3-4 lin. ad collum 12-15 lin. latum sensim ampliato, segmentis e basi quadrantis superioris 6-9 lin. lata ad basin sensim angustatis. Stamina perianthio triente breviora, antheris luteis 4-6 lin. longis. Capsula ei *gigantei* similis sed rugosior. *Insulæ japonicæ et kurilenses in sylvis umbrosis*, alt. 400-600 pedes. Oldham 866! Wilford 1000! Maximowicz! Ad initium Augusti in hortis nostris florens.

2. *L. GIGANTEUM*, *Wallich, Tent. Fl. Nep.* 21, t. 12-13 (*excl. syn.*); *Kunth, Enum.* iv. 268; *Hook. Bot. Mag.* t. 4673; *Flore des Serres*, t. 771-2; *Belg. Hort.* iii. t. 21.—*L. cordifolium*, *D. Don, Prod. Nep.* 52, non *Thunb.* Bulbus globosus caespitosus perennis 3-4-poll.

crassus, squamis ovatis subpatulis. Caulis 6-10-pedalis teres glaber viridis basi 1½-2-poll. crassus. Folia primordialis viridia haud rubro tincta, caulina 12-20, ad basin caulis producta, sparsa ovata acuta basi profunde cordata, saturate viridia, reticulato-venosa, inferiora 12-18 poll. longa et lata, petiolis erecto-patentibus canaliculatis 9-12 poll. longis, superiora sensim minora petiolis brevioribus. Racemus 12-20-florus, 1-1½-pedalis, expansus ad pedem latitudine attingens. Bracteæ naviculares magnæ ovatæ acute caducæ. Pedicelli 3-12 lin. longi, primum subcernui, fructiferi ascendentes. Perianthium infundibuliforme suaveolens 5-6 poll. longum album intus purpureo et extus viridi tinctum, tubo e basi 6-7 lin. crassa ad collum 18-21 lin. latum sensim ampliato, segmentis oblanceolatis ad basin quadrantis superioris 9-12 lin. latis ad basin sensim angustatis, interioribus latioribus. Stamina perianthio triente breviora, filamentis deorsum applanatis subrectis 3-3½ poll. longis, antheris flavis 3-4 lin. longis, polline luteo. Ovarium cylindricum 1 poll. longum, stylo vix declinato sesqui vel subduplo brevius. Capsula late oblonga 2-3 poll. longa obtuse angulata apice umbilicata collo magno turbinato. *Regio temperata per Himalayam totam a Kumaon et Gurwhal ad Khasiam et Sikkim, alt. 5000-10,000 pedes.* "Floret sub pluviis, a mense Maio usque ad finem Julii," *Wallich*.

§ *EULIRION (Endl.)*. *Perianthium* infundibuliforme segmentis oblanceolatis longe unguiculatis flore expanso apice solum falcatis intus haud papillois raro punctatis foveola carinali obscura haud excavata. *Stamina* cum stylo parallela leviter declinata. *Folia* linearia vel lanceolata sessilia vel subsessilia. *Flores* suaveolentes sæpe albi nunquam splendide rubri nec flavi.

3. *L. PHILIPPENSE*, *Hort. Veitch*; *Baker, Gard. Chron.* 1873, cum icone, *Bot. Mag.* t. inedit. Bulbus ovoideus perennis. Caulis 1½-2-pedalis monocephalus gracilis teres glaber viridis vel purpureo maculatus. Folia 30-40 sparsa sessilia falcato-patentia anguste linearia 3-4 poll. longa, 1½-2 lin. lata glabra nitide viridia trinervata. Perianthium horizontale album extus prope basin leviter viridi tinctum anguste infundibuliforme 7-8 poll. longum, tubo prope medium semipollicem crasso, segmentis oblanceolatis apice solum falcatis longe unguiculatis ad basin quadrantis superioris 15-18 lin. latis, facie plenis impunctatis, carina obscura viridi. Stamina perianthio paulo breviora filamentis viridulis leviter declinatis 5-5½ poll. longis, antheris 2½-3 lin. longis, polline flavo. Stylus cum ovario perianthio semipollicem brevior. *Insulæ Philippinæ*, Wallis in hort. Veitch.!

4. *L. WALLICHIANUM*, *Schultes fl. Syst.* vii. 1689; *Kunth, Enum.* iv.

267; *Wall. Cat.* 5076; *Hook. Bot. Mag.* t. 4561; *Lindl. et Paxt. Flow. Gard.* 1850, 120, cum icone; *Lemaire, Jard. Fleur.* t. 105, 106; *Flore des Serres*, t. 612.—*L. Batisua*, *Hamilt. MSS.*—*L. japonicum*, *D. Don, Prodr. Nep.* 52, non *Thunb.*—*L. longiflorum*, *Wallich, Tent. Fl. Nep.* 40, t. 29, non *Thunb.* Bulbus ovoideus 2-3 poll. longus squamis crassis albis acutis arcte imbricatis. Caulis 4-6-pedalis viridis strictus teres, basi horizontalis. Folia 50-60 subdistantia sparsa ascendentia sessilia acuminata glabra viridia inferiora 6-9 poll. longa, medio 3-6 lin. lata, trinervata, superiora breviora latiora sæpe 5-nervata. Flores sæpe solitarii interdum 2-3 suaveolentes ex apice peduncali horizontales vel paulo ascendentes. Perianthium album extus basi viridulum 7-9 poll. longum, tubo basi 3-4 lin., 3 poll. supra basin 5-6 lin. crasso, segmentis oblanceolato-unguiculatis acutis ad basin quadrantis superioris  $1\frac{1}{2}$ -2 poll. latis. Stamina perianthio 2 poll. breviora, antheris luteis 12-14 lin. longis. Ovarium  $1\frac{1}{2}$ -2 poll. longum. Stylus cum ovario staminibus æquilongus. *Regio subtemperata Himalayæ centralis (Kumaon, Nepaul, &c.)* 3000-4000 pedes. Adsunt in hort. Leichtlin forma *minor* gracilior foliis circiter 25 distantibus inferioribus minoribus antheris 6 lin. longis et altera *multifolia* caule 5-pedali foliis 200 multo crebrioribus et numerosi-  
oribus.

5. *L. LONGIFLORUM*, *Thunb. Linn. Trans.* ii. 333; *Bot. Reg.* t. 560; *Lodd. Bot. Cab.* t. 985; *Bury, Herand.* t. 8; *Kunth, Enum.* iv. 266; *Flore des Serres*, t. 270; *Miquel, Ann. Mus. Lug. Bat.* iii. 157. Bulbus perennis globosus flavescens squamis lanceolatis. Caulis 1-3-pedalis strictus glaber 3-4 lin. crassus viridis. Folia 20-40 sparsa ascendentia modice conferta nitide viridia glabra 5-nervata, centralia 3-4 poll. longa, medio 4-6 lin. lata, superiora distantiora breviora lanceolata. Flores sæpissime solitarii subhorizontales, interdum 2-6. Perianthium album suaveolens anguste infundibuliforme 5-7 poll. longum, tubo 2-3 poll. supra basin vix ampliato, segmentis oblanceolatis obtusis flore expanso quadrante superiore falcatis ad basin trientis superioris 12-18 lin. latis, interioribus latioribus. Filamenta alba 4-5 poll. longa, antheris flavis angustis 6-9 lin. longis, polline luteo. Ovarium 1- $1\frac{1}{2}$  poll. longum, cum stylo leviter declinato stamina vix superans. Stigma 4- $4\frac{1}{2}$  lin. crassum. Capsula anguste oblonga obtuse angulata apice umbilicata. *Regio temperata Japonia*, Oldham, 734! Maximowicz! &c. *China*, Fortune, 57, 66, Reeves! *Hongkong*, Capt. Urquhart. *Formosa*, Wilford, 548! Swinhoe! Oldham, 565! Capt. Champion. *Insulæ Loo-choo*, Capt. Beechey! C. Wright! De formis vide Duchartre, *Obs.* pp. 37-40. Stirps speciosissima omnium est *L. EXIMIUM*, *Court. Spæ Mon.* 14; *Flore des Serres*, t. 283-4.—*L. Jama-juri*, *Siebold et De Vriese, Tuinbow Flora*, i. 319, t. 11.—*L. eximium Wilsonii*, *Hort. Angl.*, habitu elatiore,

- foliis latioribus floribus majoribus 8-9 poll. longis.—L. TAKESIMA et ABCHASICUM, *Hort.* ad *longiflorum* pertinent.
6. L. NEILGHERRENSE, *Wight, Ic.* t. 2031-2.—L. tubiflorum, *Wt. Ic.* t. 2033-4.—L. Wallichianum, *Wt. Ic.* t. 2035, non *Schultes, fl.*—L. Metzii, *Steud. in Hohen. Pl. Ind. Or. Exsic.* No. 954.—L. neilgherri-cum, *Hort. Veitch. Lemaire, Ill. Hort.* x. t. 353. Bulbus globosus 2-3-pollicaris squamis crassis lanceolatis. Caulis 2-3-pedalis strictus glaber basi longe decumbens. Folia 30-40 glabra nitide viridia ascendentia conferta sparsa firma distincte 3-5-nervata inferiora 3-4 poll. longa medio 12-13 lin. lata. Flores 1-3 ascendentes albi suaveolentes. Perianthium anguste infundibuliforme 6-7 poll. longum, tubo 2-3 poll. supra basin vix ampliato, segmentis oblanceolato-unguiculatis flore expanso apice solum falcatis cuspidatis apice callosis puberulis ad basin quadrantis superioris 15-18 lin. latis. Stamina perianthio paulo breviora, antheris angustis luteis 9-12 lin. longis polline flavo. Ovarium 12-14 lin. longum, cum stylo gracili 3-3½-pollicari staminibus æquilongum. Capsula oblonga obtuse angulata. *Ad montes Indiæ peninsularis Pulnies et Neilgherries, regio temperata, Wight! Gardner! &c.*—L. TUBIFLORUM et WALLICHIANUM, *Wight*, sunt formæ foliis minoribus angustioribus, medio 6-9 lin. latis, perianthii segmentis angustioribus 12-15 lin. latis.
7. L. JAPONICUM, *Thunb. Fl. Jap.* 133; *Mém. Acad. Péters.* iii. 205, tab. v. fig. 2; *Bot. Mag.* t. 1591; *Lodd. Bot. Cab.* t. 438; *Reich. Exot.* t. 88; *Kunth, Enum.* iv. 257; *Miquel, Ann. Mus. Lug. Bat.* iii. 157.—L. odorum, *Planch. Fl. des Serres*, t. 876-7. Bulbus globosus perennis. Caulis 1-2-pedalis strictus glaber purpureo maculatus. Folia 12-20 sparsa ascendentia atro-viridia eis *longifolii* tenuiora glabra lanceolata acuta 5-7-nervata medio 8-12 lin. lata inferiora 4-6 poll. longa. Flores suaveolentes sæpissime solitarii intus albi extus plus minusve purpureo tincti. Perianthium 5-6 poll. longum late infundibuliforme e basi ad collum 15-18 lin. latum sensim ampliato segmentis oblanceolato-unguiculatis obtusis flore expanso triente superiore falcatis, ad basin trientis superioris 15-18 lin. latis. Filamenta albido-viridia perianthio triente breviora, antheris crassis oblongis 5-6 lin. longis, polline rubro. Ovarium 12-15 lin. longum, cum stylo stamina paulo superans, stigmatē 4 lin. crasso. Capsula obovoidea 2 poll. longa profunde obtuse 6-angulata. *Regio temperata, Japonia, Maximowicz! Insulæ Coreanæ, Oldham, 869!*—L. BROWNII, *Mielle, Flore des Serres*, t. 47 (L. japonicum, *Bury, Hexond.* t. 2) est forma elata grandiflora foliis 25-30, floribus majoribus extus magis purpureo saturatis.
8. L. KRAMERI, *Hort. Teutschel, Hock. fl. Bot. Mag.* t. 6058. Caulis 3-4-pedalis gracilis teres glaber purpureo-n. aculatus. Folia distantia

sparsa 15-16 lineari-lanceolata acuminata brevissime petiolata firma viridia 5-nervata margine minute papillosa 6-9 poll. longa, 6-9 lin. lata. Perianthium suaveolens horizontale solitarium late infundibuliforme albidum leviter rubellum 6-7 poll. longum e basi ad collum sensim ampliatum, segmentis oblanceolato-oblongis flore expanso triente superiore falcatis supra medium, exterioribus 15-16, interioribus 20-21 lin. latis. Filamenta perianthio subduplo breviora antheris sordide brunneis 8-9 lin. longis polline rubro. Ovarium 15-18 lin. longum, stylo leviter declinato duplo brevius, stigmatē 4-4½ lin. crasso. *Japonia*, ad initium Julii florens. Fortasse inter *speciosum* et *Japonicum* hybridum, foliis prioris, perianthio et antheris posterioris (v. v. ex hort. *Wilsoni*).

Var. *BARRIANUM*, *Baker*. Minor gracilior foliis confertioribus numerosioribus 2½-3 lin. latis trinervatis, perianthio candido 4 poll. longo, segmentis exterioribus medio 9-10, interioribus 15-18 lin. latis, ovario pollicari, stylo sesquipollicari, antheris semipollicem longis (v. v. in hort. *Barr.*).

9. *L. NEPALENSE*, *D. Don*, *Wern. Trans.* iii. 412; *Prodr. Nep.* 52; *Wallich, Pl. Asiat. Rar.* iii. 67, 291, *Cat.* 5078; *Kunth, Enum.* iv. 267.—*L. ochroleucum*, *Wall. in hb. Lindley*. Bulbum ignoro. Caulis 2-3-pedalis strictus gracilis glaber. Folia 30-50 sparsa lucide viridia ascendentia glabra lanceolata acuta vel linearia, inferiora 3-4 poll. longa medio 6-9 lin. lata distincte 5-7-nervata, superiora breviora distantia. Flores solitarii, vel pauci umbellati, leviter suaveolentes pedicellis basi verticillo foliorum reductorum bracteatis, vel pauci laxe racemosi, pedicellis inferioribus ascendentibus 2-3 poll. longis apice cernuis. Perianthium 4-5 poll. longum late infundibuliforme ochroleucum plus minus purpureo tinctum intus sæpe punctis sparsis præditum, segmentis oblanceolato-unguiculatis obtusiusculis flore expanso triente superiore falcatis, ad basin trietis superioris 6-12 lin. latis. Stamina perianthio quadrante breviora, antheris angustis 6-7 lin. longis, polline luteo. Ovarium 9-12 lin. longum, cum stylo staminum paululum superans. Capsula ovata 2 poll. longa obtuse angulata. *Regio temperata Himalayæ occidentalis et centralis ab Gurwhal et Kumaon ad Nepal, Wallich! Thomson! Jacquemont! &c.*

10. *L. CANDIDUM*, *L. Sp.* 433; *Bot. Mag.* t. 278; *Red. Lil.* t. 199; *Bury, Hexand.* t. 38; *Rzich. Ic. Germ.* t. 445; *Kunth, Enum.* iv. 266. Bulbus ovoideus perennis magnus flavescens. Folia primordialia hyemalia sessilia oblanceolata 1½-2 poll. lata. Caulis 3-4-pedalis strictus glaber nigro-viridis. Folia 100 et plura sparsa ascendentia viridia acuta 2-5-nervata margine minute papillosa, centralia linearia, 3-6 poll. longa, infima oblanceolata obtusa, superiora sensim minora, suprema lanceolata 1-1½ poll. longa ad caulem adpressa. Racemus brevis deltoideus 6-20-florus, expansus 6-8 poll. latus floribus inferi-

oribus cernuis. Bracteæ lanceolatæ vel lineares. Pedicelli ascendentes, infimi 2-3-poll. longi sæpe bracteolati. Perianthium album suaveolens late infundibuliforme 2-3 poll. longum, e basi ad collum  $1\frac{1}{2}$  poll. latum sensim ampliato segmentis flore expanso triente superiore falcatis obtusis apice puberulis supra medium 6-9 vel raro 12 lin. latis. Stamina perianthio triente breviora, antheris luteis 5-6 lin. longis. Stylus cum ovario stamina valde superans, perianthio subæquilongus. *Europa meridionalis a Corsica ad Persiam borealem et Caucasum.*

Var. STRIATUM, *Flore des Serres*, t. 735, est forma floribus extus purpureo-striatis.

Var. SPICATUM, *Hort.*, est forma monstrosa, floribus obsoletis, bracteis dilatatis albis petaloideis.

Var. PEREGRINUM, *Linn.*—*L. peregrinum*, *Mill. Dict.* No. 2; *Hayne, Arzne.* viii. t. 27; *Sweet, Brit. Flow. Gard.* ser. ii. t. 367. Gracilior, caule purpureo, foliis angustioribus, segmentis perianthii angustioribus longioribus acutioribus magis spathulatis. *Stirps hortensis diu culta, nondum in statu sylvestri cognita.*

11. *L. BELLADONNA*, *Hort. Leichtlin.* Caulis pedalis vel ultra gracilis glaber teres viridis. Folia circiter 20 lanceolata brevissime petiolata distantia viridia glabra acuminata patentia  $1\frac{1}{2}$ -2 poll. longa medio 3-4 lin. lata. Flores 1-3, terminales primum erecti, laterales expansi horizontales. Perianthium late infundibuliforme 3 poll. longum undique saturate rubellum, basi extus viridi tinctum, tubo e basi ad collum sensim ampliato, segmentis oblanceolatis impunctatis flore expanso tertio superiore falcatis, ad basin trientis superioris 8-12 lin. latis, interioribus latioribus. Stamina perianthio quadrante breviora, antheris angustis rubellis 3-4 lin. longis. Stylus leviter declinatus, cum ovario stamina superans, stigmate parvo. Habitus *L. speciosi* cum perianthio *L. candidi* sed rubello. Ex tabula Leichtliniana descriptum. *Fortasse hybrida hortensis inter speciosum et longiflorum.*

12. *L. WASHINGTONIANUM*, *Kellogg, Proc. Calif. Acad.* ii. 13; *Wood, Proc. Acad. Phil.* 1868, 166; *Baker, Gard. Chron.* 1871, 709, t. 142; *Regel, Gartenf.* t. 170; *Flore des Serres*, t. 1975-6.—*L. Bartramii*, *Nuttall, herb.* Bulbus obliquus albus subrhizomatosus, squamis parvulis lanceolatis. Caulis 3-5-pedalis teres glaber viridis apice racemosus infra racemum nudus. Folia in verticillis 6-9 5-12-foliatis disposita vel superiora sparsa oblanceolata patentia sessilia glabra 3-4 poll. longa supra medium 8-12 lin. lata acuta viridia e medio ad basin sensim angustata venulis lateralibus obliquis indistinctis. Racemus  $\frac{1}{2}$ -1-pedalis 12-20-florus, expansus 8-9 poll. latus, pedicellis ascendentibus inferioribus 2-4 poll. longis bracteis parvis oblanceolatis vel linearibus. Perianthium suaveolens infundibuliforme albidum  $2\frac{1}{2}$ -3

poll. longum intus leviter rubello vel purpureo tinctum punctis paucis parvis lilacinis sparsis, segmentis oblancoelatis e basi trientis superioris 6-8 lin. lata ad basin sensim angustatis, flore expanso triente vel quadrante superiore falcatis. Stamina perianthio quadrante breviora, antheris luteis 5-6 lin. longis. Ovarium 8-9 lin. longum, stylo curvato subtriplo brevius. *California in sylvis montium Sierra Nevada, &c., Jeffray, 1139! Bridges, 270; W. Lobb, 248!*

Var. PURPUREUM, *Hort. Bull.* Minor, gracilior, caule 1-1½-pedali, foliis 1-1½ poll. longis, floribus 4-8 umbellatis, segmentis magis falcatis 5-6 lin. latis vinoso-purpureo saturatis punctis minutis secus faciem totam sparsis, stylo 9-12 lin. longo, antheris 2-3 lin. longis. *California e valle Yosemite. In hortis Angliæ anno 1873 late dispersa.*

ARCHELIRION, *Baker. Perianthium* late infundibuliforme vel campanulatum, segmentis ovato- vel oblongo-lanceolatis flore expanso profunde falcatis, facie punctatis, deorsum papillosis, sulco carinali profunde excavato. *Stamina* ab stylo declinato late divergentia.

13. L. TIGRINUM, *Gawl. Bot. Mag. t. 1237; Red. Lil. t. 395 et 475; Kunth, Enum. iv. 259.—L. speciosum, Andrews, Bot. Rep. t. 586, non Thunberg.* Bulbus perennis globosus squamis oblongo-lanceolatis acutis. Caulis 2-4-pedalis nigrescens vel brunneus albo-araneosus. Folia saturate viridia sparsa glabra ascendentia firma linearia 3-4 poll. longa medio 3-6 raro 9 lin. lata 5-7-nervata, superiora breviora bulbillis rubro-brunneis in axillis prædita. Racemus 3-10- raro 20-25-florus latus deltoideus expansus interdum 12-15 poll. longus et latus bracteis parvis ovatis, pedicellis divaricatis strictis apice cernuis sæpe bracteolatis inferioribus 3-4 poll. longis. Perianthium 3-4 poll. longum, splendide rubrum vel aurantiaco tinctum, segmentis late falcatis acuminatis apice callosis puberulis, infra medium 9-18 lin. latis, interioribus multo latioribus, omnibus facie punctis magnis nigro-purpureis præditis, unguibus papillis melanocephalis copiosis præditis, foveola carinali profunde excavata marginibus pubescentibus. Filamenta coccinea 2-2½ poll. longa, antheris nigrescentibus 6-8 lin. longis polline coccineo. Ovarium viride 9-12 lin. longum. Stylus 1½-2-pollicaris valde declinatus. Capsulam non vidi. *Japoniæ et Chinæ regio temperata.* Ad finem Julii et per totum Augusti floret. De formis cultis vide *T. Moore, Florist, 1873, 14.—SPLENDENS, Flore des Serres, t. 1932, Wilson, Journ. Hort. 1873, 251, cum icone, Floral Mag. t. 509 (Leopoldi, Hort.), est forma grandiflora valde serotina punctis majoribus foliis latioribus caule minus araneoso.—FORTUNEI est forma minus serotina caule dense albido-araneoso.—LISHMANNI, Moore, Florist, 1873, 13, cum icone, est forma punctis ad dimidium centrale segmentorum restrictis basi et apice impunctatis.—EREC-TUM pedicellis minus divaricatis floribus suberectis.*

14. *L. OXYPETALUM*, Baker.—*Fritillaria oxypetala*, Royle, *Ill. Him.* 388? Hook. *Bot. Mag.* t. 4731; Lemaire, *Jard. Fleur.* t. 422.—*Lilium triceps*, Klotsch, *Reise, Wald.* 33, t. 93. Bulbus oblongus squamis paucis lanceolatis acuminatis  $1\frac{1}{2}$  poll. longis. Caulis gracilis teres viridis monocephalus glaber  $1-1\frac{1}{2}$ -pedalis. Folia 20–30 primum dense rosulata sparsa ascendente viridia glabra lanceolata vel linearia 2–3 poll. longa medio 3–6 lin. lata. Perianthium horizontale late infundibuliforme 15–18 lin. longum segmentis oblongis acutis late imbricatis medio 8–9 lin. latis purpurascensibus dorso viridi tinctis facie dimidio inferiore purpureo punctatis basi arcte papillosis, ungue brevi profunde sulcato extus barbato. Stamina perianthio triente breviora, antheris purpurascensibus 3–4 lin. longis, filamentis divergentibus. Ovarium clavatum 5–6 lin. longum. Stylus rectus ovario brevior. Capsula obovoideo-oblonga 9–12 lin. longa obtuse angulata valvis apice emarginatis. *Regio temperata Himalayæ occidentalis*, Hoffmeister. *Kumaon ad Pindari alt. 12500 pedum*, Strachey et Winterbottom!
15. *L. SPECIOSUM*, Thunb. *Linn. Trans.* ii. 332; *Bot. Reg.* t. 2000; Zuccarini, in Sieb. *Fl. Jap.* iii. 31. t. 12 et t. 13, fig. 1; Kunth, *Enum.* iv. 259; *Bot. Mag.* t. 3785; *Flore des Serres*, t. 276.—*L. lancifolium*, Mussehe, *Paxt. Mag.* v. 267, cum icone, non Thunb. Bulbus perennis globosus brunneus vel rubro-brunneus squamis lanceolatis pollicem longis laxiusculis. Caulis 2–3-pedalis strictus teres glaber viridis vel rubello maculatus. Folia 12–20 sparsa distantia brevissime petiolata petiolo ad caulem adpresso oblongo-lanceolata acuta vel acuminata nitide viridia firmiter glabra basi rotundata, inferiora 5–6 poll. longa medio 15–18 lin. lata, distanter distincte 5–7-nervata. Racemus deltoideus 3–10-florus pedicellis divaricatis, bracteolatis infimis 3–5 poll. longis, centralibus apice suberectis, lateralibus apice cernuis. Perianthium 3–4 poll. longum, segmentis ovato-lanceolatis profunde falcatis 12–21 lin. latis, interioribus latioribus, albis sæpissime plus minusve rubro suffusis, facie rubro punctatis papillis copiosis, sulco carinali profundo glabro. Filamenta late divergentia  $2\frac{1}{2}$ –3 poll. longa, antheris angustis 9–12 lin. longis polline croceo vel rubro. Ovarium 1 poll. longum; stylus gracilis valde declinatus  $1\frac{1}{2}$ – $2\frac{1}{2}$ -pollicaris. Capsula obovoideo-oblonga 2 poll. longa obtuse angulata apice umbilicata. *Japonia regio temperata ad initium Augusti florens*. De formis cultis vide Masters, *Gard. Chron.* 1872, p. 1522.—PUNCTATUM, Lemaire (lancifolium, *Paxt. Mag.* v. t. 267, albiflorum, Hook. *Bot. Mag.* t. 3785), est forma albiflora punctis et papillis rubris.—TAME-TOMO, Zucc. et Spæ. (eximium, *Hort. olim*; L. Broussartii, Morren, *Mém. Acad. Roy. Brux.* Feb. 1834, cum icone; vestale, Masters, *loc. cit.*), est forma albiflora impunctata.—KRÆTZERI, Duchartre, est forma albiflora segmentis dorso late viridi vittatis.
16. *L. AURATUM*, Lindl. *Gard. Chron.* 1862, 644b; Hook. *Bot. Mag.*



t. 5338; *Flore des Serres*, t. 1528-1531; *Ill. Hort.* ix. t. 338; *Rev. Hort.* 1867, t. 371; *Miquel, Ann. Mus.* iii. 156.—*L. Dexteri*, *Hovey, Mag. Hort.* Aug. 1862.—*L. Wittei*, *Suring. in Koch. Wochens.* 1867, 294.—*L. speciosum imperiale*, *Hort, Siebold*. Bulbus omnino *L. speciosi*. Caulis 2-4-pedalis viridis vel purpureo tinctus gracilis teres glaber. Folia 20-30 sparsa distantia brevissime petiolata petiolo ad caulem adpresso lanceolata acuminata saturate viridia glabra firma 5-nervata, inferiora 6-9 poll. longa 9-15 lin. lata. Racemus deltoideus 3-10-florus pedicellis divaricatis bracteolatis. Perianthium 5-7 poll. longum, segmentis late falcatis medio 1-2 poll. latis, interioribus latioribus, albis medio sæpissime aureo-vittatis, punctis purpureis sparsis deorsum facie papillois, foveola carinali distincta marginibus glabris. Filamenta 3-3½ poll. longa, antheris angustis 9-12 lin. longis, polline rubro. Ovarium 12-14 lin. longum; stylus gracilis valde declinatus 2½-3½-pollicaris. Capsula 3-pollicaris oblonga, ei *speciosi* longior et angustior apice emarginata. *Japonia*, Oldham, 1861 Maximowicz! Formæ adsunt floribus rubro-vittatis ad *speciosum* vergentes; et foliis 25-30 latioribus et foliis 40-50 angustioribus.—*L. Wittei*, *Suringar*, est varietas floribus albis impunctatis.

§ ISOLIRION, *Baker*. *Perianthium* late infundibuliforme diutine erectum, sæpissime splendide rubrum vel flavum, segmentis oblongo-lanceolatis basi spathulatis vel unguiculatis, facie punctatis et papilloso-lamellatis foveola carinali profunde excavata præditis. *Stamina* ab stylo erecto undique divergentia.

17. *L. PHILADELPHICUM*, *L. Sp.* 435; *Miller, Ic.* t. 165. fig. 1; *Bot. Mag.* t. 519; *Red. Lil.* t. 104; *Lodd. Bot. Cab.* t. 976; *Herb. Amat.* t. 92; *Bot. Reg.* t. 594; *Kunth, Enum.* iv. 263. Bulbus parvus annuus stoloniferus squamis fragilibus crassis subclavatis. Caulis 1-3-pedalis viridis gracilis teres glaber. Folia 20-30 lanceolata vel linearia patentia tenuia glabra subtiliter nervata sessilia, inferiora 3-4 poll. longa medio 3-6 lin. lata in verticillos 4-6 6-8-foliatos disposita vel pauca vel multa sparsa. Flos 1 terminalis erectus vel pauci umbellati, pedicellis 2-3 poll. longis ascendentibus basi verticillo foliorum magnorum bracteatis. *Perianthium* 2-3 poll. longum, splendide rubro-luteum, segmentis oblongo-lanceolatis medio 6-10 lin. latis basi unguiculo distincto 6-8 lin. longo præditis, facie dimidio inferiore punctis magnis purpureis sparsis, foveola glabra profunde excavata marginibus unguibus revolutis marginata. *Stamina* perianthio triente breviora, antheris 5-6 lin. longis polline rubro. Ovarium 9-10 lin. longum, stylo subduplo brevius. Capsula anguste obovoidea obtuse angulata. *America borealis ab Canada ad Carolinam*.

Var. *L. ANDINUM*, *Nuttall, Gen.* i. 221.—*L. umbellatum*, *Pursh, Flora*,

- i. 229.—Var. *wansharaicum*, *Hort., Leicht.*; *Duchartre, Obs.* 88. Folia linearia omnia sparsa. *Montes Scopulosi, Douglas! Bourgeau! &c.*
18. *L. MEDEOLOIDES*, *A. Gray, Mem. Amer. Acad.* vi. 415; *Miquel, Ann. Mus. Lug. Bat.* iii. 156.—*L. maculatum, Thunb. Linn. Trans.* ii. 334; *Mem. Acad. Petrop.* iii. 204, tab. 5. fig. 1?—*L. canadense, Thunb. Fl. Jap.* 204? Caulis 1–2-pedalis gracilis glaber teres flexuosus. Folia pleraque in verticillum unicum 7–14-foliatum supra medium caulis dispositum aggregata, oblanceolata patentia tenera glabra viridia 4–6 poll. longa, supra medium 9–15 lin. lata, acuta venis lateralibus 2–4 distinctis, pauca reducta supra verticillum sparsa. Flores solitarii vel 2–3 umbellati, pedicellis brevibus apice erectis. Perianthium 12–15 lin. longum erectum aperte infundibuliforme splendide aurantiaco-rubrum, punctis paucis vinosis intus decoratum, segmentis lanceolatis e basi leviter falcatis apice callosis canaliculatis puberulis medio 3–4 lin. latis, basi leviter spathulatis, foveola carinali obscura glabra. Filamenta perianthio duplo breviora, antheris 4–5 lin. longis. Ovarium clavatum 4 lin. longum, stylo erecto paulo brevius. *Japonia prope Hakodadi, C. Wright. Insula Koreana Herschel, in sylvis inundatis, mense Junio florens, Oldham, 873! Ad Martagon et avenaceum habitu magis accedit, sed facile distinguitur floribus erectis segmentis falcatis haud revolutis genitalibus brevibus.*
19. *L. CONCOLOR*, *Salisb. Parad.* t. 47; *Kunth, Enum.* iv. 259 et 673; *Fisch & Mey. Ind. Sem.* 1839, 55.—*L. sinicum, Lindl. in Paxt. Flow. Gard.* vol. ii. *Misc.* 115, t. 193; *Lemaire, Ill. Hort.* t. 100; *Van Houtte, Flore des Serres*, t. 1206. Bulbus ovoideus perennis parvus squamis paucis albidis oblongis acutis. Caulis gracilis subpedalis obscure puberulus, purpureo suffusus. Folia 20–30 ascendunt sparsa lanceolata saturate viridia acuta 2½–3 poll. longa medio 4–6 lin. lata obscure 7-nervata margine papilloso-ciliata. Flores 1–3, pedicellis puberulis purpureis ascenduntibus 1½–2 poll. longis interdum bracteolatis. Perianthium 15–18 lin. longum, intus obscure coccineum immaculatum, extus pallidius, segmentis late falcatis lanceolatis medio 4–6 lin. latis apice callosis puberulis basi paullulum papillosis, foveola carinali excavata marginibus glabris præditis. Filamenta perianthio duplo breviora, antheris 3–4 lin. longis polline rubro. Ovarium clavatum 5–6 lin. longum profunde sulcatum; stylus clavatus 3–4 lin. longus brevissimus omnium. Capsula 1 poll. longa obovoideo-oblonga obtuse angulata. *China, ad finem Junii florens.*—*L. CONCOLOR, Bot. Mag.* 1165, est forma segmentis intus prope basin punctis paucis obscuris præditis.
- Var. *L. BUSCHIANUM, Lodd. Bot. Cab.* t. 1628.—*L. pulchellum, Rev. Hort.* 1862, 131, *cum icone.*—*L. concolor, var. sinicum, Bot. Mag.* t. 6005. Interdum elatior, bulbo majore solitario squamis paucis

latis, foliis angustioribus saturate viridibus, floribus interdum 4-6, perianthii segmentis paulo latioribus intus splendide coccineis, faciei dimidio inferiore punctis parvis nigrescentibus numerosis sparsis, capsula anguste obovoidea sesquipollicari apice umbilicata. *Siberia meridionalis*.

Var. L. PARTHENEION, *Sieb. et De Vriese, Tuinbow Flora*, ii. 341, cum icone, ab *Buschiano* vix differt nisi habitu sæpe graciliore, foliis nitide viridibus et bulbis cæspitosis. *Japonia*.—L. CORIDION, *Sieb. et De Vriese, loc. cit., Duchartre, Obs.* 42, est stirps eadem floribus flavis.

Var. L. PULCHELLUM, *Fisch. & Mey. Ind. Sem. Petr.* 1839, 56; *Kunth, Enum.* iv. 266, 676; *Regel, Gartenfl.* 1860, 81, t. 284. fig. 2. Bulbus ovoideus vix pollicaris. Caulis gracillimus subpedalis, foliis 12-20 anguste linearibus ascendentibus 2-2½ poll. longis 1½-2 lin. latis. Perianthium sæpe solitarium rubrum, 12-15 lin. longum, segmentis oblanceolatis obtusis medio 3-5 lin. latis, dimidio inferiore punctis pluribus nigrescentibus minutis decoratis. Filamenta 5-6-linearia. Ovarium 3-4-lineare, stylum superans. *Siberia orientalis; et forma flaviflora in Japonia culta, Maximowicz! In montosis lapidosis Mongolice Chinensis, Meyer et Turczaninow in herb. DC.!*

20. L. BULBIFERUM (*Parkinson, Parad.* 37, t. 2), *L. Sp.* 433 ex parte; *Jacq. Fl. Austr.* t. 226; *Bot. Mag.* t. 1018; *Fisch. & Mey. Ind. Sem.* 1839, 54; *Kunth, Enum.* iv. 264, 674; *Regel, Gartenfl.* 1872, 231, cum icone bulbi. Bulbus ovoideus perennis squamis paucis latis acutis. Struculi primordiales lati obtusi rubro tincti. Caulis 2-4-pedalis strictus sulcatus purpureo maculatus sursum albo-araneosus. Folia pauciora quam in croceo et magis ascendencia, inferiora circiter 3 poll. longa medio 3-6 lin. lata, superiora reducta, in axillis bulbillifera. Flores in exemplis sylvestribus 1-3, in cultis sæpe plures umbellati vel deltoideo-racemosi. Pedicelli crassi breves purpureo maculati albo araneosi. Perianthium 2-2½ poll. longum erectum inodorum splendide rubrum sæpe fundo aurantiaco tinctum, segmentis oblongo-spathulatis, medio 9-15 lin. latis, interioribus minus unguiculatis quam in croceo, omnibus facie nigro-punctatis deorsum valde lamellatis et papillois, sulco semipollicari profunde excavato, marginibus pilosis. Filamenta 18-21 lin. longa, antheris 3-4 lin. longis, polline rubro. Ovarium 7-8 lin. longum, stylo duplo brevius. Capsula 1½ poll. longa obovoidea obtuse 6-angulata apice umbilicata. *Europa centralis et Scandinavia austro-orientalis*, in hortis nostris inter priores per mensem Junii florens, ante croceum et *davuricum*.—L. LATIFOLIUM, *Link, Enum.* i. 321, est forma magna latifolia hortensis.—L. HUMILE, *Miller, Dict.* no. 4, est forma parva foliis angustis.—L. PUBESCENS, *Bernh. Kunth, Enum.* iv. 265, est verisimiliter forma hortensis pedunculis valde araneosis. De formis vide *Parkins. Parad.* 38.

21. *L. croceum* (Fuchs), *Chaix in Vill. Delph.* i. 322; *Kunth, Enum.* iv. 265 et 675; *Fisch. & Mey. Ind. Sem.* vi. 56; *Gren. Fl. France.* iii. 182.—*L. bulbiferum*, *DC. Fl. France.* iii. 202; *Bot. Mag.* t. 36, et *auct. magna ex parte*.—*L. aureum*, *Parkinson, Paradiseus*, 37, t. 3. Bulbus globosus perennis squamis magnis ovato-lanceolatis medio haud constrictis. Surculi primordiales lati obtusi rubro tineti. Caulis 3–6-pedalis robustus sulcatus viridis sursum purpureo maculatus plus minusve araneosus. Folia 50–100 sparsa conferta patentia vel infima leviter squarrosa linearia, inferiora 3–4 poll. longa 3–4 lin. lata 3–5-nervata, sessilia glabra firma, nunquam in axillis bulbifera. Flores in exemplis sylvestribus sæpe solitarii, in cultis sæpe 10–20 in racemum deltoideum vel umbellam dispositi. Pedicelli ascendentes 2–3 poll. longi albo-araneosi. Perianthium erectum late infundibuliforme 2–2½ poll. longum, expansum 3 poll. latum primum extus albo-araneosum, segmentis exterioribus oblongo-lanceolatis infra medium 8–9 lin. latis basi spathulatis, interioribus ovato-lanceolatis infra medium 12–14 lin. latis basi distincte unguiculatis, omnibus splendide aurantiacis vix coccineo tinetis apice cuspidatis puberulis flore expanso imbricatis copiose punctatis et valde lamellato-papillois, sulco semipollicem longo profunde excavato marginibus pilosis. Filamenta 15–18 lin. longa, antheris 4 lin. longis, polline rubro. Ovarium 8–9 lin. longum; stylus 12–14 lin. longus. Capsula obovoidea 1½ poll. longa subacute 6-angulata. *Helvetia, Gallia, Italia borealis in hortis sub formis plurimis diu culta ad initium Julii post bulbiferum florens.*
22. *L. davuricum*, *Gawl. Bot. Mag. sub t.* 1210; *Kunth, Enum.* iv. 264; *Regel, Gartenflora*, t. 740, et 1872, 295.—*L. pennsylvanicum*, *Gawl. Bot. Mag.* t. 872.—*L. spectabile*, *Link, Enum.* i. 321; *Reich. Ic. Exot.* t. 30; *Fisch. & Mey. Ind. Sem.* vi. 58; *Kunth, Enum.* iv. 676; *Regel, Gartenf.* t. 349, 1872, 231, *cum icone bulbi*. Bulbus globosus perennis squamis parvis panduriformibus acutis albis fragilibus medio constrictis. Surculi primordiales angusti acuti brunneo tineti. Caulis 2–3-pedalis gracilis viridis sursum leviter albo-araneosus. Folia 20–50 ascendente sessilia linearia trinervata, inferiora 4–5 poll. longa medio 3–4 lin. lata nunquam in axillis bulbifera. Flores in exemplis sylvestribus sæpe solitarii, in cultis pauci umbellati vel breviter racemosi, pedicellis nudis vel leviter araneosis. Perianthium splendide rubrum. 2½–2 poll. longum expansum 4½–3 poll. latum segmentis oblongo-lanceolatis infra medium 9–12 lin. latis flore expanso vix imbricatis minus punctatis et lamellatis quam in *croceo* et *bulbifero*, basi spathulatis, sulco profunde excavato 8–9 lin. longo marginibus pilosis. Filamenta rubra 18–21 lin. longa, antheris 5–6 lin. longis, polline rubro. Stylus ovario subduplo longior. Capsula 1½–2 poll. longa obtuse angulata. *Siberia centralis et orientalis a montibus Altai*

*ad Kamtchatkam. In hortis nostris cum croceo mense Julio post bulbiferum florens.*—L. UMBELLATUM *hort. plur. est davuricum, forma luxurians hortensis. De formis vide Regel, Gartenfl. 1872, 295.*

23. L. ELEGANS, *Thunb. Mem. Acad. Petr. iii. 203, tab. 3. fig. 2.*—L. bulbiferum, *Thunb. Linn. Trans. ii. 333.*—L. philadelphicum, *Thunb. Fl. Jap. 135.*—L. Thunbergianum, *Schultes fil. Syst. Veg. vii. 415; Lindl. Bot. Reg. 1839, t. 38; Maund. Bot. t. 158; Regel, Gartenfl. 1872, 296.*—L. aurantiacum, *Paxt. Mag. vii. 127, cum icone. Bulbus eis bulbiferi et crocei similis. Caulis subpedalis viridis glaber vel leviter araneosus vel pilosus robustus sulcatus. Folia 20–30 ascendentia sparsa firma saturate viridia glabra distincte 5–7-nervata, inferiora 3–4 poll. longa, superiora breviora, medio 6–12 lin. lata, in axillis haud bulbifera. Perianthium sœpissime solitarium 3–3½ poll. longum, expansum 5–6 poll. latum rubro-aurantiacum, segmentis oblongo-spathulatis obtusis vix punctatis multo minus lamellatis et papillosis quam in *davurico*, foveola distincte excavata 8–9 lin. longa marginibus pilosis, exterioribus medio 12–13, interioribus 15–18 lin. latis. Filamenta 1½–2-pollicaria, antheris 4–5 lin. longis. Ovarium 1 poll. longum, stylo sesqui brevius. Capsula obovoidea 2 poll. longa subacute 6-angulata, sesqui longiora quam lata. *Japonia, in hortis nostris Julio ineunte florens, sub formis per plurimis, quarum sequentes sunt notabiles:—**

Var. 1. BREVIPOLIUM, *Baker & Dyer, Gard. Chron. 1872, 1356.*—L. alternans *hort.* Folia latiora breviora, inferiora 2–2½, superiora 1–1½-pollicaria, omnia 7–9 lin. lata saturate viridia. Perianthium minus apertum, ubique pallide rubrum, fundo punctis paucis nigris decoratum. Filamenta et stylus paulo longiora.

Var. 2. BICOLOR, *Moore, Floral Mag. t. 104.*—L. pictum *hort., Siebold.*—L. aurantiacum *hort., Krelage.* Caulis vix pedalis, foliis circiter 40 angustioribus inferioribus 4–6 lin. latis. Perianthium 3–3½ poll. longum, segmentis latissimis omnium, interioribus 18–21 lin. latis, centro luteo, lateribus rubris, punctis prope basin paucis.

Var. 3. PARDINUM, *Moore, Florist, 1861, 121, cum icone,* ab 2 vix differt, nisi caule elatiore 2–3-pedali, floribus paucis umbellatis.

Var. 4. ALUTACEUM, *Baker & Dyer, Gard. Chron. loc. cit.*—L. Thunbergianum aureum nigro-maculatum, *Flore des Serres, t. 1627.* Caulis nanus, foliis circiter 30, flore solitario, perianthio pallide armeniaco segmentis interioribus 12–13 lin. latis punctis copiosis purpurascens- tibus dimidio inferiore decoratis.

Var. 5. ARMENIACUM, *Baker & Dyer, loc. cit.* Caulis subpedalis, foliis 30–40 inferioribus linearibus, floribus 1–2 aurantiacis impunctatis, lamellis et papillis obsoletis, segmentis 9–12 lin. latis.

Var. 6. CITRINUM *hort., Wilson,* ab armeniaco vix differt nisi caule 2–2½-pedali, foliis lanceolatis, floribus 2–3.

Var. 7. SANGUINEUM, *Lindl. Bot. Reg. 32, t. 50.* Caulis 1–1½-pedalis

- foliis circiter 40 lanceolatis. Flores 1-2, segmentis latis sanguineo-rubris, paullo aurantiaco commixtis, punctis paucis minutis prope basin decoratis, papillis et lamellis subobsoletis.
- Var. 8. ATROSANGUINEUM, *Baker & Dyer, loc. cit.*—L. *coruscans hort.* Caulis 1-1½-pedalis, foliis lanceolatis, floribus sæpissime solitariis, segmentis latis, saturate rubris, dimidio inferiore punctis numerosis decoratis, papillis et lamellis copiosis parum elevatis.—L. *hæmatochroum, Lemaire, Ill. Hort. t. 503*, est forma similis floribus obscurioribus livide rubris.
- Var. 9. L. FULGENS, *Morren, in Spæe Mem. 29; Lemaire, Ill. Hort. t. 657*, ad *davuricum* accedit caule 1-1½-pedali, foliis 40 linearibus, floribus sæpe 4-6 saturate rubris, punctis lamellis et papillis pæne obsoletis.—L. VENUSTUM, *Kunth, Flore des Serres, t. 652*, est forma similis flore splendidiore magis aurantiaco commixto.—L. WILSONI *hort.*, teste *Leichtlin*, est verisimiliter inter *elegantem* et *speciosum* hybridum.
24. L. CATESBÆI, *Walt. Fl. Carol. 123; Bot. Mag. t. 259; Lodd. Bot. Cab. t. 807; Sweet, Brit. Flow. Gard. ser. ii. t. 185; Kunth, Enum. iv. 263.*—L. *spectabile, Salisb. Stirp. Rar. t. 5, non Link.*—L. *carolinianum, Catesby, Car. ii. t. 58, non Michx.* Bulbus ei *philadelphici* omnino similis. Caulis 1-2-pedalis gracilis teres glaber viridis. Folia 20-30 sparsa ascendentia glabra viridia lanceolata vel linearia, inferiora 2-3 poll. longa 4-6 lin. lata, superiora sensim minora. Perianthium solitarium erectum late infundibuliforme 3-4 poll. longum splendide rubro-aurantiacum, segmentis oblongo-lanceolatis medio 6-12 lin. latis longe distincte cuspidatis basi ungue canaliculato marginibus revolutis 9-15 lin. longo præditis facie punctis purpureis sparsis. Filamenta 2½-3 poll. longa, antheris angustis 4-6 lin. longis polline rubro. Ovarium 9-12 lin. longum; stylus gracilis ovarium duplo superans. *America borealis ab Georgia et Carolina ad Floridam.*
- § MARTAGON (*Endl.*). *Flores* racemosi cernui punctati sæpissime splendide rubri vel aurantiaci, *perianthio* late campanulato, *segmentis* lanceolatis profunde valde falcatis, *foveolis* profunde impressis, *staminibus* ab stylo declinato undique divergentibus.
25. L. CANADENSE, *Linn. Sp. 435; Bot. Mag. t. 800 and 858; Kunth, Enum. iv. 258; Bury, Hexand. t. 12; Flore des Serres, t. 1174.*—L. *penduliflorum, DC. in Red. Lil. t. 105.*—L. *pendulum, Spæe, Mem. 28.*—Martagon sive Liliium canadense maculatum, *Parkins. Parad. 32, t. 2.* Bulbus annuus, stolones 5-6 poll. longos emittens, squamis crassis obtusis vix semipollicem longis. Caulis 1½-3-pedalis gracilis

glaber teres viridis. Folia sæpe in verticillos regulares 4-5 distantes 4-8-foliatos disposita, sed verticillis interdum plus minus diffractis, oblanceolata acuta 3-4 poll. longa supra medium 6-9 lin. lata viridia tenuia 5-7-nervata venis interdum ciliatis. Flores 1 vel pauci umbellati vel corymbosi pedicellis 2-6 poll. longis apice valde cernuis interdum bracteolatis. Perianthium 2-2½ poll. longum, late infundibuliforme, splendide rubro-aurantiacum, segmentis oblanceolatis 6-7 lin. latis supra medium falcatis facie copiose vinoso punctatis, deorsum lamellatis, foveola distincte impressa marginibus glabris. Filamenta perianthio triente breviora, antheris 4-6 lin. longis. Ovarium 8-9 lin. longum, stylo subrecto paulo brevius. Capsula turbinata obtuse angulata 1½ poll. longa septis teneris, apice haud umbilicata. *America borealis orientalis a Canada ad Georgiam.* Ab sectione *Martagon* cum *monadelpho* ad *Eulirion* recedit, perianthio infundibuliformi flore expanso supra medium solum revoluta. Var. PENDULIFLORUM *hort.*, *Leicht.*, est forma segmentis ad vel infra medium revolutis.

Var. 1. *L. PARVUM*, *Kellogg, Proc. Calif. Acad.* ii. 179, t. 52; *Regel, Gartenflora*, t. 725; *Duchartre, Obs.* 98. Bulbus et perianthium formæ typicalis, sed habitu in hortis nostris minore graciliore. Caulis viridis 1-1½-pedalis. Folia superiora sæpissime sparsa. Flores multo minus cernui, interdum suberecti. Perianthium 15-18 lin. longum, splendide rubro-aurantiacum, copiose punctatum, segmentis acutis 3-5 lin. latis supra medium falcatis. Antheræ oblongæ 2-3 lin. longæ. Ovarium 3-4 lin. longum, stylo subrecto duplo brevius. *California ad montes Sierra Nevada, altit. 6000 pedes*, *Jeffray, 1283!* Teste *Kellogg* ad 5 pedes altitudine pervenit floribus 50.

Var. 2. *WALKERI*, *Wood, Proc. Amer. Acad.* 1868, 166. Caulis 3-pedalis et ultra. Folia tenera angustiora in verticillos regulares 7-8-foliatos valde distantes disposita, inferiora 4-5 poll. longa 4-5 lin. lata, venis præter costam gracillimis. Flores plures in racemum angustum elongatum dispositi. Perianthium infundibuliforme 10-15 lin. longum, segmentis 2½-3 lin. latis, apice solum falcatis. Stamina perianthio paulo breviora, antheris oblongis 1½ lin. longis. Ovarium 4 lin. longum, stylo recto duplo brevius, stigmate minimo. *California, Walker, Bridges 268!*

Var. 3. *PARVIFLORUM*, *Hook. Flor. Bor. Am.* ii. 281.—*L. Sayii, Nuttall, MSS.*—*L. canadense*, var. minus, *Wood, Proc. Acad. Phil.* 1868, 166. Caulis 2-3-pedalis. Folia verticillata vel plurima sparsa oblanceolata tenera, inferiora 6-12 lin. lata. Flores 1 vel pauci umbellati cernui. Perianthium 18-21 lin. longum, segmentis oblanceolatis obtusiusculis e medio 3-4 lin. lato arcute reflexis. Stamina perianthio triente breviora, antheris 3 lin. longis. Ovarium 6 lin. longum stylo æquilongum. *Columbia britannica et Oregon*, *Nuttall!* *Douglas!* *Lyll!* &c. Bulbus *L. canadensis* cum perianthio magis revoluta *L. pardalini* et *superbi* sed minore.

26. *L. PARDALINUM*, Kellogg, *Proc. Calif. Acad.* ii. 12, cum icone; *Duchartre, Obs.* 97. Bulbi (annui vel biennes?) breviter rhizomatosi, squamis paucis laxis lanceolatis acutis. Caulis 3-4-pedalis teres viridissimus glaber. Folia sæpe in 3-4 verticillos 9-12-foliatos distantes prope medium caulis disposita, superiora pauca sparsa, oblanceolata nitide viridia 3-4 poll. longa acuta medio 9-12 lin. lata glabra tenera venis lateralibus immersis. Flores 3-6 in corymbum vel umbellam laxam disposita pedicellis elongatis apice cernuis. Perianthium 2-2½ poll. longum, splendide rubrum, fundo aurantiacum, segmentis lanceolatis obtusiusculis medio 6-9 lin. latis profunde revolutis dimidio inferiore cito aurantiaco punctis magnis purpureo-brunneis instructo, paullulum lamellato-papilloso foveola excavata marginibus glabris. Stamina perianthio triente breviora, antheris rubris 4-5 lin. longis. Stylus ovarium vix superans 12-14 lin. longus. Capsula oblonga apice umbicata angulis acutiusculis. *California*, W. Lobb 249! &c.
- Var. 1. *CALIFORNICUM*, hb. Lindley; *Florist*, 1873, t. 33 (*sphalmate ad calcem tabulæ* "Washingtonianum"). Folia pauciora latiora minus regulariter verticillata. Flores 1-3 majores 3-4 poll. longi, segmentis obtusiusculis 9-12 lin. latis, ut in forma typicali dimidio superiore splendide coccineis, inferiore cite aurantiaco punctis magnis purpureo-brunneis. Filamenta et stylus 1½-2-pollicaria. *California*, Hartweg! (Exemplum originale in hb. Lindleyano nunc Cantabrigiensi vidi.)
- Var. 2. *PALLIDIFOLIUM*, Baker.—*L. puberulum hort.*, *Leichtlin, non Torrey*. Elatior, caule in hortis nostris 4-5-pedali viridi glabro, foliis 50-80 oblanceolatis glabris pallide viridibus, eis *pardalini* firmioribus, distincte 5-7-nervatis, superioribus sæpissime regulariter verticillatis, inferioribus ad basin, tempore florendi, sparsis. Flores, si plures, laxe racemosi vel umbellati, pedicellis elongatis apice cernuis. Perianthium 2-2½ poll. longum, segmentis acutioribus medio 5-6 lin. latis infra medium arcte reflexis, rubro faciei pallidioribus quam in *pardalino* et magis cum luteo fundis commixto, punctis paucioribus minoribus. Stamina perianthio subtriente breviora. *California*, hort., *Leichtlin*!
- Var. 3. *BOURGÆI*, Baker, ab *pallidifloro* differt, ex exemplis paucis visis, foliis angustioribus omnibus regulariter verticillatis distincte 3-5-nervatis, venis faciei inferioris ciliatis, punctis faciei segmentorum more *pardalini* numerosioribus majoribus. *Ad ripas lacus Winipeg*, Bourgeau! et in hortos anglicos nuperrime introducta.
27. *L. SUPERBUM*, *L. Sp.* 434; *Bot. Mag.* t. 936; *Red. Lil.* t. 103; *Bury, Hexand.* t. 36; *Kunth, Enum.* iv. 258; *Flore des Serres*, t. 1014-15. Bulbi magni cæspitosi globosi perennes squamis numerosis acutis arcte imbricatis rubro tinctis. Folia primordialia firma glaucoviridia. Caulis 4-6-pedalis robustus strictus purpureo tinctus. Folia sæpe in verticillos 3-4 8-10-foliatos disposita, pauca vel plurima



sparsa, anguste oblanceolata acuta firmula sordide viridia glabra distincte 3-5-nervata, inferiora 4-5 poll. longa medio 6-9 lin. lata. Flores sæpe 6-12, interdum 20-40, in paniculam deltoideam 9-12 poll. latam dispositi, pedicellis apice cernuis, inferioribus 3-5 poll. longis divaricatis. Perianthium 3-4 poll. longum, splendide rubro-aurantiacum, segmentis acutis lanceolatis medio 6-9 lin. latis profunde cîte revolutis dimidio inferiore punctis vinosis conspicuis decoratis paullulum lamellatis, foveola impressa marginibus glabris præditis. Filamenta 2-2½-pollicaria, valde divergentia, antheris rubellis 6-9 lin. longis. Ovarium 9-12 lin. longum, stylo declinato paulo brevius. Capsula obovoidea obtuse 6-angulata. *A Canada ad Georgium et Carolinam in sylvis et locis uliginosis.*

Var. *L. CAROLINIANUM*, *Michx, Flora*, i. 197; *Bot. Mag.* t. 2280; *Bot. Reg.* t. 580; *Kunth, Enum.* iv. 258.—*L. Michauxii*, *Poir. Ency.* iii. 457.—*L. Michauxianum*, *Schult. fil. Syst.* vii. 258.—*L. autumnale*, *Lodd. Bot. Cab.* t. 355. Bulbus omnino formæ typicalis. Folia primordialia præcociora nitide viridia crassiora. Folia multo pauciora latiora breviora sæpe 5-6 prope medium caulis in verticillum disposita, reliqua sparsa. Caulis 1-2-pedalis mono- vel oligocephalus. Perianthium omnino formæ typicalis, sed segmenta interdum latiora obtusiora. *A Virginia et Carolina ad Floridam*, mense Augusto in hortis nostris florens, cum serotinis.

28. *L. ROEZLEI*, *Regel, Gartenfl.* t. 667.—*L. canadense*, var. *Hartwegii*, *Baker, Gard. Chron.* 1871, 321. Bulbus perennis rhizomatosus. Caulis 2-3-pedalis gracilis glaber. Folia in exemplis visis 20-30, pauca superiora vel inferiora verticillata vel omnia sparsa ascendente firma glabra anguste linearia acuta obscure 3-5-nervata, inferiora 4-5 poll. longa medio 3-4 lin. lata. Flores 1-10, si plures corymbosi vel umbellati, pedicellis elongatis apice cernuis. Perianthium 2-3 poll. longum, splendide rubro-aurantiacum, segmentis acuminatis medio 5-6 lin. latis dimidio inferiore luteo punctis purpureis pluribus decoratis, supra basin arcte reflexis, foveola distincta marginibus glabris præditis. Stamina perianthio triente breviora, antheris 5-6 lin. longis. Stylus declinatus ovarium duplo superans. Capsulam ignoro. *Montes Scopulosi in ditone Utah*; *Roezl* in hortos europæos introduxit. *California ad montes Santa Cruz*, *Hartweg* 2003! Ab affinis facile distinguitur foliis et perianthii segmentis angustis acutis.

29. *L. COLUMBIANUM*, *Hanson in hort., Leichtlin.* Bulbus ovoideus perennis parvus albus acutus, squamis lanceolatis. Caulis 1½-2-pedalis gracilis viridis glaber. Folia pauca inferiora in verticillos 4-5-foliatos disposita, superiora sparsa oblanceolata acuta 1½-2 poll. longa medio 5-6 lin. lata. Flores 2-3 umbellati pedicellis gracilibus 2-4 poll. longis apice cernuis foliis reductis basi bracteatis interdum bracteolatis. Perianthium 1½-2 poll. longum, splendide rubro-aurantiacum.

- segmentis lanceolatis e medio 4-6 lin. lato arcte reflexis, facie crebre purpureo punctatis, foveola glabra leviter excavata. Stamina perianthio triente breviora, antheris 3-4 lin. longis. Stylus ovarium vix superans. *Oregon, W. Lobb 350! hort., Leichtlin. A canadensi, var. parviflora, vix differt nisi bulbo haud rhizomatoso.*
30. *L. HUMBOLDTII, Roehl & Leicht., Duchartre, Obs. 105; Regel, Gartenf. t. 724; Flore des Serres, t. 1973-4.—L. Bloomerianum, Kellogg, Proc. Calif. Acad. iv. (1871) 60.—L. Robinsonianum, hort., Ang. Bulbus magnus 2-4 poll. crassus obliquus perennis haud rhizomatosus squamis paucis ovato-lanceolatis acutis 2-3 poll. longis. Caulis teres robustus 4-5-pedalis glaber vel puberulus viridis rubello maculatus. Folia sæpissime regulariter verticillata, in verticillos 4-6 10-15-foliatos disposita, oblanceolata, inferiora 4-5 poll. longa, supra medium 9-12 lin. lata acuta firma, saturate viridia undulata venis lateralibus distinctis, ad faciem inferiorem interdum ciliatis. Flores sæpe 6-10 interdum 30-40 in paniculam deltoideam expansam pedem latam dispositis, pedicellis divaricatis apice cernuis inferioribus 3-5 poll. longis, foliis oblanceolatis valde reductis bracteatis. Perianthium 3-4 poll. longum, splendide rubro-aurantiacum, extus basi viridescens, segmentis acutis medio 9-12 lin. latis supra basin arcte reflexis, ad faciem punctis vinoso-purpureis magnis copiosis decoratis, prope basin leviter papilloso-lamellatis, foveola distincte excavata marginibus glabris. Filamenta  $1\frac{1}{2}$ -2-pollicaria, antheris rubris 6-8 lin. longis. Stylus 6-7 lin. longus ovario subtriplo brevior. Capsula magna obovoidea, more *Martagonis* acute 6-angulata. *California ad montes Sierra Nevada, Roehl, in hort. Leichtlin.—L. canadense, var. puberulum, Torrey, Bot. Whipple, 90 (Hartweg 2004!), est forma hujus speciei caule et foliis subtus puberulis. Var. OCELLATUM, Kellogg, Proc. Calif. Acad. v. 88, t. 4, ex insula Santa Rosa, est forma perianthio luteo punctis faciei purpureis conspicuis.**
31. *L. MARTAGON, L. Sp. 435; Jacq. Austr. t. 351; Bot. Mag. t. 893 and 1634; Red. Lil. t. 146; Eng. Bot. t. 279, edit. 3, t. 1518; Reich. Ic. Germ. t. 451. Bulbus ovoideus  $1\frac{1}{2}$ -2-pollicaris flavescens perennis squamis permultis angustis. Caulis 3-6-pedalis teres glaber vel sursum puberulus viridis vel purpureo-maculatus. Folia pleraque in verticillos 2-4 6-9-foliatos disposita, superiora vel raro omnia sparsa, horizontalia oblanceolata spathulata sessilia tenera, inferiora 4-6 poll. longa, supra medium 12-15 lin. lata tenera venis distinctis utrinque costam 3-5 distantibus glabra vel pubescentia, internodiis centralibus 6-9 poll. longis. Racemus laxis elongatus 3-20-florus, bracteis parvis, pedicellis floriferis cernuis, infimis 1-3 poll. longis. Perianthium suaveolens vinoso-purpureum 15-18 lin. longum, extus dorso pubescens segmentis lanceolatis valde revolutis intus punctis copiosis livide purpureis decoratis unguibus leviter lamellatis foveola profunde exca-*

- vata margine papillosa, apice cucullatis crassis puberulis. Filamenta 8-10 lin. longa, antheras duplo excedentia, polline rubro. Ovarium 5-6-lineare, stylo valde declinato sesqui brevis. Capsula turbinata acute angulata apice umbilicata. *Europa centralis et meridionalis ad Siberiam et Japoniam ad finem Junii et initium Julii in hortis nostris florens.* De formis vide Parkinson, Parad. 31.—*L. hirsutum*, Miller, *Dict. No. 10* (*L. Milleri*, Schultes, *Obs. 67*) est forma robusta caule puberulo.—*L. glabrum*, Spreng. *Syst. ii. 62*, est forma floribus albis caule glabro foliis nitide viridibus, polline luteo. Etiam adsunt formæ floribus vinosis impunctatis et carneis.
- Var. *L. CATTANÆ*, Visiani, *Fl. Dalm. Suppl. 32*, t. 3. Segmenta perianthii crassissima omnium specierum, saturate nigro-vinoso-purpurea, punctis subobsoletis. *Dalmatia*, hort., Leichtlin.—*L. MARTAGON DALMATICUM*, Maly, est forma similis vel endem.
32. *L. AVENACEUM*, Fischer, *Maxim. in Regel, Gartenfl. 1865*, 290, t. 485.—*L. Martagon*, Led. *Fl. Ross. iv. 149*, *ex parte*. Bulbus globosus parvus perennis squamis plurimis lanceolatis. Caulis glaber teres  $1\frac{1}{2}$ -2-pedalis, foliis sæpissime 6-9 ad medium caulis disposita, pauca inter verticillum et racemum sparsa raro in verticillos 2 vel omnia sparsa, horizontalia oblanceolata 3-4 poll. longa supra medium 6-18 lin. lata glabra tenera textura et venatione eorum *L. Martagonis*. Flores pauci, interdum subumbellati, bracteis parvis, pedicellis apice cernuis infimis 2-3 poll. longis. Perianthium leviter odorum, 15-18 lin. longum, splendide rubro-flavum, segmentis lanceolatis medio 4-6 lin. latis apice cucullatis, intus punctis minutis decoratis, foveola glabra profunde excavata. Filamenta 9-12 lin. longa, antheris 3-4 lin. longis. Ovarium 4-5 lin. longum, stylo declinato duplo brevis. *Kamtchatka, Manchuria, insulæ Kurilenses, Japonia.* Pallas! Maximowicz! &c. Habitus et folia *L. Martagonis*, cum perianthio rubro-flavo *L. canadensis*.
33. *L. HANSONI*, Leicht. Bulbus ci *tigrini* similis globosus perennis compactus albidus. Caulis 3-4-pedalis gracilis glaber teres robustus viridis. Folia oblanceolata acuta viridia tenera glabra nervis laterali-bus 3 obliquis teneris distantibus, sæpissime 8-12 in verticillum unicum ad medium caulis aggregata patentia sessilia, reliqua sparsa, 4-5 poll. longa, supra medium 8-12 lin. lata, e medio ad basin sensim angustata. Flores 4-10 in racemum laxum dispositi, vel in umbellam congesti, pedicellis erecto-patentibus  $1\frac{1}{2}$ -2 poll. longis, bracteis parvis ovato-lanceolatis. Perianthium 15-18 lin. longum splendide rubello-aurantiacum, segmentis crassis lanceolatis medio 4-5 lin. latis profunde falcato-revolutis, faciei dimidio inferiore purpureo-punctatis, foveola longa glabra profunde excavata præditis. Filamenta 10-12 lin. longa lutea, antheris angustis 4-5 lin. longis, polline flavo. Ovarium clavatum profunde sulcatum 5-6 lin. longum stylo paulo brevis.

*Japonia*, hort., Leichtlin! inter primas vegetans et florens. Inter *Martagon* et *canadensem* medium tenens.

34. **L. MONADELPHUM**, *M. Bieb. Fl. Taur.* i. 267; *Cent. Pl. Ross.* t. 4; *Gawl. Bot. Mag.* t. 1405; *Kunth, Enum.* iv. 260; *Fisch. & Lall. Ind. Sem. Petrop.* 1839, 57; *Reich. E.vot.* t. 89; *Regel, Gartenf.* t. 733.—**L. Loddigesianum**, *Schultes, fil. Syst. Veg.* vii. 416; *Kunth, Enum.* iv. 261; *Lemaire, Jard. Fleur.* t. 204; *Pavt. Flow. Gard.* t. 58.—**L. Szovitsianum**, *Fisch. & Lall. Ind. Sem. Petr.* 1839, 58; *Kunth, Enum.* iv. 674; *Regel, Gart.* t. 436; *Flore des Serres*, 507-9.—**L. colechicum**, *Steven.* Bulbus ovoideus albidus perennis squamis pluribus lanceolatis. Caulis 2-5-pedalis robustus viridis puberulus. Folia 30-50 sparsa ascendencia lineari-lanceolata vel oblanceolata viridia distincte multinervata, centralia 3-4 poll. longa, medio 6-12 lin. lata, dorso et margine pubescentia. Racemus sæpissime 2-16 interdum 20-30-florus, pedunculis  $1\frac{1}{2}$ -2 poll. longis apice cernuis bracteis magnis geminatis lanceolatis. Perianthium suaveolens sulphureum  $2\frac{1}{2}$ - $3\frac{1}{2}$  poll. longum, segmentis oblanceolatis supra medium falcatis 9-12 lin. latis basi et apice purpureo tinctis facie punctis minutis nigrescentibus paucis decoratis nullo modo papillosis, fovcola glabra leviter impressa præditis. Filamenta 18-21 lin. longa viridia applanata e basi ad basin tridentis superioris valvata, antheris 5-6 lin. longis polline rubro. Ovarium 7-8 lin. longum, stylo subrecto duplo brevius. Capsula obovoidea 18-21 lin. longa obtuse angulata apice umbilicata. *Caucasus et Persia borealis, in hortis nostris mense Junio cum prioribus florens.* Planta originalis Biebersteinii est forma mera filamentis deorsum coalitis. Ab speciebus reliquis hujus stirpis ad § *Eulirion*, forma perianthii, defectu papillorum &c. recedit.
- Var. **β. L. LEDEBOURII**, *Baker.*—**L. pyrenaicum**, *Led. Fl. Ross.* iv. 151, non *Gouan.* Humilior, foliis angustioribus 80-100 linearibus 7-nervatis medio 4-6 lin. latis subtus vix pubescentibus. Segmenta perianthii 6-8 lin. lata. *Caucasus*, *Güldenstädt, C. A. Meyer (v. v. in hort. Kew.)*.
35. **L. POLYPHYLLUM**, *D. Don in Royle, Ill. Him.* 388; *Kunth, Enum.* iv. 677; *Klotzsch, Reise Wald.* 53.—**L. punctatum**, *Jacquem., Duchartre, Obs.* 76. Caulis glaber teres 3-4-pedalis. Folia 40-60 ascendencia sparsa (vel inferiora interdum verticillata teste Jacquemont) viridia sessilia acuta glabra margine minute papillosa, textura et venatione eorum **L. Martagonis**, inferiora oblanceolata 4-5 poll. longa supra medium 6-9 lin. lata, superiora angustiora linearia. Pedunculus infra racemum 5-6-poll. nudus. Racemus latus 4-10-florus, ramis sæpe oppositis, bracteis verticillatis, pedicellis floriferis apice cernuis, inferioribus 3-5 poll. longis. Perianthium 18-21 lin. longum, suaveolens, "livide flavescens, punctis vinoso-purpureis" (*Jacquemont*) segmentis oblanceolatis 2-3 lin. latis e medio revolutis.

- Filamenta 15-16 lin. longa, antheris 4 lin. longis. Ovarium 6-7 lin. longum, stylo valde declinato sesqui brevis. Capsula obovoidea, 12-15 lin. longa subacute angulata. *Regio temperata Himalayæ occidentalis* (*Kunawar, Kashmir, &c.*), Royle, Thomson! Jacquemont!
36. *L. PONTICUM*, K. Koch, *Linnaea*, xxii. 234; *Duchartre, Obs.* 22. Bulbus ovoideus pollicaris perennis squamis pluribus lanceolatis. Caulis  $1\frac{1}{2}$ -2-pedalis gracilis sursum puberulus. Folia 20-30 sparsa lanceolata firma ascendencia 15-18 lin. longa 4-5 lin. lata, superiora angustiora, venis pluribus distinctis, facie inferiore et margine pubescentia. Flores 1-6 cernui 18-21 lin. longi flavi, segmentis oblanceolatis infra medium reflexis medio 3-4 lin. latis vix punctatis foveolis leviter impressis. Filamenta perianthio duplo breviora antheris 3-4 lin. longis. Ovarium 6 lin. longum, stylo clavato paulo brevius. Capsula 1 poll. longa obovoidea obtuse angulata. *Montes Armeniae* alt. 6000-7000 pedes, K. Koch; *Lazistan, regio montana*, Balansa, *Plantes de l'Orient*, anno 1866, no. 1531! Folia et habitus *L. monadelphii* sed gracilior, perianthio typicali magis revoluta hujus stirpis. Tabula Regeliana (*Gartenflora*, t. 436) a K. Kochio ad *ponticum* adscripta, est sensu nostro *Szovilsianum* verum. Exemplum angustifolium adest in herbario Candollei, ex *Lazistan*, foliis confertioribus inferioribus 3 poll. longis 3-4 lin. latis ad varietatem *monadelphii* respondens.
37. *L. CARNIOLICUM*, *Berth. in Mert. & Koch, Deutsch. Flora*, ii. 536; *Kunth, Enum.* iv. 260; *Reich. Ic. Flor. Germ.* t. 990; *Parl. Fl. Ital.* ii. 404.—*L. chalconicum*, *Linn. Sp. Plant.* 434 *ex parte*; *Jacq. Fl. Austr. Suppl.* t. 20. *Martagon pannonicum* sive *exoticum* flore spadiceo, *Parkins. Parad.* 35. Bulbus perennis ovoideus squamis pluribus lanceolatis. Caulis 2-3-pedalis viridis puberulus. Folia 30-40 sparsa ascendencia lanceolata vel lineari-lanceolata, inferiora 2-3 poll. longa medio 6-9 lin. lata plana distincte multinervata, marginibus et venis faciei inferioris distincte ciliatis, superiora breviora ad pedunculum adpressa. Racemus pauciflorus, pedicellis 2-3 poll. longis apice cernuis interdum bracteolatis. Perianthium  $1\frac{1}{2}$ -2 poll. longum, splendide luteum vel miniatum, segmentis oblanceolatis arcte revolutis medio 5-6 lin. latis, facie punctis pluribus minutis decoratis, deorsum papillosis, foveolis distincte excavatis. Filamenta 8-12 lin. longa, antheris 5-6 lin. longis, polline croceo. Ovarium 5-6 lin. longum, stylo clavato æquilongum. Capsula  $1\frac{1}{2}$  poll. longa obtuse angulata. *Lombardia, Istria, Dalmatia, Illyria, Austria, Bosnia mense Junio florens.*
38. *L. TESTACEUM*, *Lindl. Bot. Reg.* 1842, *Misc.* 51; 1843, t. 11; *Pact. Mag. Bot.* 1843, 221, *cum icone*; *Kunth, Enum.* iv. 673; *Flore*

*des Serres*, t. 39; *Regel, Gartenfl.* t. 349.—*L. excelsum*, *Walp. Ann.* vi. 110.—*L. isabellinum*, *Kunze in Mohl & Schlecht. Bot. Zeit.* i. 609. Bulbus globosus perennis. Caulis 4–5-pedalis sulcatus leviter puberulus brunneo tinctus. Folia 60–100 sparsa conferta linearia ascendentia, firma obscure viridia 3–5-nervata, inferiora 3–4 poll. longa medio 3–4 lin. lata marginibus albido-puberulis superioribus sensim minoribus 1–1½ poll. longis ad caulem adpressis marginibus albis magis distinctis ab floribus remotis. Flores 3–10 umbellati vel racemosi, suaveolentes pedicellis erecto-patentibus 4–6 poll. longis apice cernuis, foliis reductis albo marginatis bracteatis. Perianthium 2½–3 poll. longum, obscure luteum, segmentis profunde revolutis 9–12 lin. latis prope basin punctis paucis minutis rubellis decoratis, leviter papilloso-lamellatis, foveola excavata marginibus glabris instructis. Filamenta perianthio duplo breviora, antheris 5–6 lin. longis polline rubro. Ovarium 6–8 lin. longum stylo declinato subduplo brevius. *Stirps hortensis, ad finem Julii florens, verisimiliter inter candidum et chalconicum hybrida.*

39. *L. LEICHTLINII*, *Hook. fil. Bot. Mag.* t. 5673; *Ill. Hort.* t. 540; *Flore des Serres*, t. 1736; *Belg. Hort.* 1869, t. 11; *Floral Mag.* t. 509. Bulbus parvus perennis globosus squamis paucis latis acutis crassis arcte imbricatis. Caulis 2–3-pedalis atro-brunneus gracilis obscure puberulus basi repens. Folia 30–40 sparsa linearia ascendentia saturate viridia firma plana distincte trinervata, inferiora 3–5 poll. longa 3–4 lin. lata, suprema lanceolata, ab floribus remota. Flores pauci laxe corymbosi pedicellis erecto-patentibus 3–4 poll. longis apice cernuis. Perianthium inodorum 2½–3 poll. longum splendide citrinum extus purpureo tinctum intus punctis vinosis conspicuis e basi supra medium sparsum, segmentis lanceolatis medio 6–9 lin. latis, profunde revolutis, apice callosis canaliculatis, prope basin leviter lamellatis, foveola excavata marginibus obscure pubescentibus instructis. Filamenta flava, 2–2¼-pollicaria, late divergentia, antheris rubro-brunneis 6–7 lin. longis. Ovarium gracile 9 lin. longum, stylo declinato triplo brevius. *Japonia*, Maximowicz! in hortis nostris ad finem Julii cum *tigrino* florens.

Var. MAJUS, *Wils. in Journ. Hort.* 1873, 371, cum icone, est forma luxurians 5-pedalis foliis 6–7 poll. longis.—*L. MAXIMOWICZII*, *Regel, Ind. Sem. Hort. Petr.* 1866, 26; *Gart.* 1868, 322, t. 596; *Animad.* 1873, 20, est varietas floribus splendide puniceis. *Japonia*, Maximowicz!

40. *L. PSEUDO-TIGRINUM*, *Carrière, Revue Hort.* 1867, 410, cum icone; *Regel, Gart.* 1868, 118; *Animad.* 1873, 21. Bulbus ovoideus perennis squamis acutis adpressis modice crassis. Caulis 3–4-pedalis basi erectus albido-puberulus luride viridis teres obscure maculatus. Folia sparsa linearia 4–5 poll. longa 3–4 lin. lata recurvato-patentia

marginē revoluta initio marginē et basi extus albido-araneosa. Racemus laxus 4-6-florus, pedicellis erecto-patentibus 2-3 poll. longis apice cernuis, bracteis et bracteolis linearibus. Perianthium 2-2½ poll. longum, splendide puniceum, intus punctis copiosis nigro-orunneis decoratum, segmentis ovato-lanceolatis supra basin 8-12 lin. latis valde revolutis copiose papilloso-lamellatis foveola excavata instructis. Filamenta 2-pollicaria coccinea, antheris 6-7 lin. longis polline rubro. Stylus coccineus 1½-pollicaris valde declinatus, ovarium duplo superans. *China, ad initium Julii in hortis nostris florens.*

41. *L. POMPONIUM*, *L. Sp.* 434; *Bot. Mag.* t. 971; *Kunth, Enum.* iv. 266; *Reich. Ic. Germ.* t. 991; *Gren. Fl. France*, iii. 181.—*L. rubrum*, *Lam. et DC. Gall.* iii. 213. Bulbus ovoides perennis squamis pluribus lanceolatis. Caulis 2-3-pedalis crassus strictus sulcatus. Folia 100 vel plura saturate viridia sparsa anguste linearia ascendentia, inferiora 2-4 poll. longa, 1½-2 lin. lata, trinervata marginibus papilloso leviter revolutis, infima 3-4 lin. lata, superiora breviora anguste linearia. Pedunculus 2-3 poll. infra racemum nudus. Racemus 2-15-florus, pedunculis apice cernuis sæpe bracteolatis. Perianthium odorum 1½-2 poll. longum, sæpissime miniatum, intus copiose papillosum et nigro-punctatum, segmentis arcte revolutis oblanceolatis 3-4 lin. latis, foveola glabra distincte excavata, marginibus glabris. Filamenta viridia 12-14 lin. longa, antheris 3-4 lin. longis, polline miniato. Ovarium 5-6 lin. longum stylo paulo brevius. Capsula obovoidea 1½ poll. longa apice umbilicata subacute 6-angulata. *Italia borealis et Gallia meridionalis, ad finem Junii in hortis nostris florens.*  
*L. ANGUSTIFOLIUM*, *Mill. Dict.* No. 6, est forma gracilior foliis angustissimis uninervatis.

Var. *L. PYRENAICUM*, *Gouan, Ill.* 25; *Red. Lil.* t. 145; *Reich. Ic. Germ.* t. 992; *Kunth, Enum.* iv. 262.—*L. flavum*, *Lam. Gall.* iii. 283. Robustior, foliis paulo latioribus distincte trinervatis sæpe ad basin racemi productis, floribus flavis majoribus bracteis majoribus stylo crassiore. *Regio montana Pyrenaica.*—*MARTAGON LUTEUM NON PUNCTATUM*, *Parkins, Theat.* 35, est forma floribus flavis impunctatis.

42. *L. CHALCEDONICUM*, *Linn. Sp. Plant.* 434, *ex parte*; *Gawl. Bot. Mag.* t. 30; *Red. Lil.* t. 276; *Kunth, Enum.* iv. 262; *Reich. Ic. Germ.* t. 993. *non Jacq.*—*L. rubrum byzantinum* sive *Martagon constantinopolitanum*, *Parkins, Parad.* 34. Bulbus ovoides perennis flavescens squamis pluribus lanceolatis. Caulis strictus puberulus 3-4-pedalis viridis purpureo tinctus. Folia 100 vel plura ascendentia conferta sessilia pallide viridia, infima oblanceolata, centralia linearia 2-3 poll. longa, 2-3 lin. lata, 3-5-nervata, marginibus et venis faciei inferioris distincte albo-papilloso, superiora minora ad pedunculum adpressa. Racemus pauciflorus pedunculis apice cernuis sæpe bracte-

olatis. Perianthium inodorum  $1\frac{1}{2}$ –2 poll. longum, sæpissime splendide miniatum impunctatum, interdum punctis minutis intus decoratum, raro flavum, segmentis oblanceolatis arcte revolutis medio 5–6 lin. latis, papillis copiosis, foveola distincte impressa marginibus glabris. Filamenta 12–14 lin. longa, antheris 4–4 $\frac{1}{2}$  lin. longis, polline miniato. Ovarium 5–6 lin. longum, stylo subæquilongum vel paulo brevius. Capsula obtuse angulata. *Græcia et insule Ionice, in hortis nostris ad finem Julii et initium Augusti inter serotinos florens.*—L. ALBANICUM, *Grisch. Fl. Rumel.* ii. 385; *Schur. Transyl.* 662.—L. PYRENAICUM, *Baumg. Transyl.* 632, non *Gouan*, ex montibus Albanie et Transylvaniae, est forma sylvestris montana floribus flavis sæpissime solitariis.—L. GRACILE, *Ebel, Zwölf Tuge auf Montenegro*, 8, t. 1, flore ignoto, ex montibus Montenegro, non vidi.

43. L. CALLOSUM, *Sieb. et Zucc. Fl. Jap.* ix. 86, t. 41; *Kunth, Enum.* iv. 262; *Miquel, Ann. Mus. Lug. Bat.* iii. 156.—L. pomponium, *Thunb. Fl. Jap.* 134, non *Linn.* Bulbus parvus perennis squamis paucis lanceolatis. Caulis  $1\frac{1}{2}$ –3-pedalis gracilis teres glaber. Folia 30–40 sparsa linearia ascendentia glabra firma viridia 3–5-nervata marginibus anguste revolutis inferiora 3–4 poll. longa medio 1–2 lin. lata, superiora sensim minora. Racemus angustus latus 2–12-florus pedicellis brevibus cernuis, bracteis geminatis ligulatis crassis 4–9 lin. longis apice obtusis callosis. Perianthium semper splendide coccineum, 12–18 lin. longum, segmentis oblanceolato-spathulatis  $2\frac{1}{2}$ –3 lin. latis apice cucullatis, facie nullo modo punctatis, foveola glabra profunde excavata marginibus glabris. Filamenta perianthio triente breviora, antheris coccineis 3–4 lin. longis. Ovarium 5–6 lin. longum, stylo clavato leviter declinato æquilongum. Capsula obovoidea 15–18 lin. longa obtuse angulata. *Japonia et insule Loo-choo*, Maximowicz! Oldham, 872! Buerger! &c.
44. L. TENUIFOLIUM, *Fisch. Ind. Sem. Hort. Gorenk.* 1812, 8; *Schultes, fl. Syst. Veg.* vii. 409; *Kunth, Enum.* iv. 263.—L. pumilum, *DC. in Red. Lil.* t. 378; *Kunth, Enum.* iv. 263.—L. limifolium, *Hornem. Hort. Hafn.* i. 326.—L. puniceum, *Sieb. et De Vriese, Ann. Hort. Pays-Bas*, 1861, 23. Bulbus parvus globosus annuus? squamis pluribus lanceolatis. Caulis 1–2-pedalis gracillimus teres glaber. Folia 30–50 angustissima sparsa ascendentia, centralia  $1\frac{1}{2}$ –2 poll. longa  $\frac{1}{2}$ –1 lin. lata 1-nervata marginibus revolutis. Pedunculus 2–3-poll. infra racemum nudus. Racemus latus 1–20-florus. Pedicelli 2–3 poll. longi apice cernui bracteis lineari-subulatis geminatis. Perianthium 15–18 lin. longum, splendide pallide coccineum segmentis oblanceolatis medio 3–4 lin. latis valde revolutis facie sæpissime concoloribus raro punctis paucis minutis nigrescentibus decoratis foveola glabra distincte impressa præditis. Filamenta pallide rubra 8–9 lin. longa, antheris duplo longiora, polline coccineo. Ovarium 4–4 $\frac{1}{2}$  lin.



longum, stylo gracili sesqui brevius. *Siberia a montibus Altai ad Amurland et Chinam borealem, Pallas! Maximowicz! &c.*

Var. *L. STENOPHYLLUM, Baker.*—*L. pumilum hort., Leichtlin, non DC.* Bulbus magis ovoideus squamis paucioribus latoribus. Caulis robustior elatior, foliis distantibus  $1\frac{1}{2}$ –2 lin. latis trinervatis. Perianthium 18–21 lin. longum, tubo duplo longiore et magis cylindrico quam in typo, segmentis angustioribus magis ligulatis. *Siberia orientalis hort., Leichtlin.*

#### Species dubiæ.

45. *L. NANUM, Klotzsch. Reise Wald. 53.* Semipedale, “puberulum usque ad basin foliorum, uniflorum; foliis linearibus gramineis obtusiusculis strictis erectis 5-nerviis; flore cernuo parvo campanulato candido; perigonii foliolis oblongis obtusis, omnibus sessilibus; stigmatate incrassato trigono puberulo; filamentis subulatis; antheris oblongis obtusis basi obtuso-bifidis.” *Himalaya occidentalis, Hoffmeister.*

46. *L. LANCIFOLIUM, Thunb. Linn. Trans. ii. 333; Mem. Acad. Petrop. iii. 202, t. 3; Kunth, Enum. iv. 266.*—*L. bulbiferum, Thunb. Jap. 134.* Habitus et folia *L. elegantis*. Caulis angulatus hirsutus erectus simplex pedalis et ultra. Folia sparsa subdistantia ascendencia, inferiora linearia sensim acuminata 3–4 poll. longa infra medium 5–6 lin. lata, superiora sensim breviora lanceolata in axillis bulbifera. Flores erecti in exemplo solo 2, pedicellis brevissimis foliis ovatis reductis bracteatis. “Corollæ” (an plene evolutæ dubito) “parvæ unguiculares albæ.” *Japonia, Thunberg.* Ex notis Thunbergianis et tabula ab Prof. Areschoug benevole communicata descripta. Verisimiliter forma imperfecte evoluta *L. elegantis*.

#### 2. FRITILLARIA, Linn.

*Gen. No. 411; Endl. Gen. No. 1096; Kunth, Enum. iv. 246.*—*Petilium, Linn. Hort. Cliff. 119; Kunth, Enum. iv. 245.*—*Imperialis, Moench, Meth. 395.*—*Amblyrion, Rafin. Journ. Phys. 89. 102; Bernh. Bot. Zeit. 1835, 595.*—*Theresia, K. Koch, Linn. xxii. 232.*—*Rhinopetalum, Fisch. Edin. New Phil. Journ. 1830, 19; Endl. Gen. No. 1097.*—*Sarana, Fisch. MSS.*—*Liliorrhiza, Kellogg, Proc. Calif. Acad. 2. 46, t. 1.*—*Monocodon et Lyperia, Salisb. Gen. 56.*—*Eucrinum, Nuttall, Journ. Acad. Phil. vii. 54.*—*Tozzettia, Parl. Nuov. Gen. 11.*—*Korolkowia, Regel, Animad. (1873) 17.*—*Notholirion, Wallich, MSS.*

*Perianthium* 6-partitum corollinum sæpe saturate vinoso-purpu-

reum plus minusve viridulo vel albido tessellatum vel suffusum, segmentis oblanceolato-oblongis obtusiusculis vel obtusis diutine imbricatis dimidio inferiore vel supra basin faciei nectario glanduloso glabro foveolatis. *Stamina* 6, segmentis sæpissime breviora, antheris oblongis prope basin affixis leviter versatilibus longitudinaliter dehiscentibus, filamentis filiformibus leviter perigynis deorsum paulo applanatis. *Ovarium* subsessile 3-loculare, ovulis in loculo crebris horizontalibus; stylus filiformis elongatus, sæpissime apice stigmatoso tricuspidatus, interdum indivisus. *Capsula* obovoidea breviter stipitata membranacea obtuse vel acute 6-angulata seminibus discoideis dimidiato-obovatis testa tenui brunnea.—*Herbæ bulbosæ, bulbis membranaceo-tunicatis vel squamis crassis cinctis, foliis linearibus vel lanceolatis sæpissime paucis, infimis vel supremis sæpe verticillatis, floribus magnis sæpissime vinoso-purpureis solitariis vel paucis vernalibus, nunquam splendide flavis vel rubris, raro pluribus racemosis vel umbellatis.*

Subgenus I. EUFRITILLARIA. *Bulbus tunicatus. Stylus tricuspidatus. Foveolæ æquales distinctæ elongatæ.*

Foveola 5-6-linearis. Stigmata stylo subduplo breviora.

1. *Meleagris.*

Foveola 3-4-linearis. Stigmata brevissima ..... 2. *delphinensis.*

Subgenus II. MONOCODON. *Bulbus tunicatus. Stylus tricuspidatus. Foveolæ æquales distinctæ latæ.*

Folia suprema sæpissime opposita vel verticillata.

Elatæ, foliis anguste linearibus apice nunquam cirrosis.

3. *tenella.* 4. *pontica.* 5. *messanensis.* 6. *Reuteri.*

7. *involutata.* 8. *Roylei.*

Elatæ, foliis superioribus apice cirrosis.

9. *cirrosa.* 10. *verticillata.* 11. *ruthenica.*

Humiliores, foliis latis. 12. *lutea.* 13. *pallidiflora.*

Elatæ, foliis omnibus sparsis anguste linearibus.

14. *meleagroides.* 15. *lusitanica.* 16. *pyrenaica.* 17. *Olivieri.*

18. *acmopetala.* 19. *Kotschyana.*

Humiliores, foliis latis omnibus sparsis.

20. *græca.* 21. *tristis.* 22. *conica.* 23. *Guicciardii.*

24. *Hermontis.* 25. *crassifolia.* 26. *kurdica.*

Subgenus III. AMBLIRION. *Bulbus tunicatus. Stylus indivisus. Foveolæ obscuræ æquales.*

Stamina perianthio subduplo breviora.

27. *bithynica*. 28. *Forbesii*. 29. *Gardneriana*.

Stamina perianthio triente breviora.

30. *Pinardi*. 31. *assyriaca*. 32. *Ehrharti*.

Stamina perianthio paulo breviora.

33. *Fleischeri*. 34. *tulipifolia*. 35. *pudica*.

Subgenus IV. KOROLKOWIA. *Bulbus tunicatus stoloniferus*. *Stylus indivisus*. *Foveolæ elongatæ inæquales*.

Species sola ..... 36. *Sewerzowi*.

Subgenus V. RHINOPETALUM. *Bulbus tunicatus*. *Stylus indivisus*. *Foveolæ profundæ breves inæquales*.

Species sola ..... 37. *Karelini*.

Subgenus VI. NOTHOLIRION. *Bulbus tunicatus*. *Stylus tricuspidatus*. *Foveolæ æquales obscuræ elongatæ*.

38. *macrophylla*. 39. *Hookeri*.

Subgenus VII. THERESIA. *Bulbus squamosus*. *Stylus indivisus*.

Orientalis ..... 40. *persica*. 41. *libanotica*.

Americana ..... 42. *pluriflora*.

Subgenus VIII. GONIOCARPA. *Bulbus squamosus*. *Stylus tricuspidatus*. *Capsula acute angulata*. *Flores solitarii vel racemosi*.

Asiatica ..... 43. *dagana*.

Americanæ.

44. *alba*. 45. *lanceolata*. 46. *parviflora*. 47. *atropurpurea*.

Subgenus IX. LILIORHIZA. *Bulbus squamosus*. *Stylus tricuspidatus*. *Capsula obtuse angulata*.

Stamina perianthio paulo breviora ..... 48. *recurva*.

Stamina perianthio duplo breviora.

49. *liliacea*. 50. *biflora*. 51. *kamtchatcensis*.

Subgenus X. PETILIUM. *Bulbus squamosus*. *Stylus tricuspidatus*. *Capsula acute angulata*. *Flores umbellati*.

Species sola ..... 52. *imperialis*.

Subgenus I. *EUFRITILLARIA*, *Baker*. Bulbus membranaceo-tunicatus. Caulis sæpissime monocephalus. Stylus apice stigmatoso distincte tricuspidatus. Segmenta tessellata supra basin foveola lineari vel lanceolata instructa.—*Fritillaria*, *Salisb.*

1. *F. MELEAGRIS*, *L. Sp.* edit. i. 304 (excl. var.); *Engl. Bot.* t. 622; *Jacq. Austr. App.* t. 32; *Red. Lil.* t. 222; *Fl. Dan.* t. 972; *Kunth, Enum.* iv. 251; *Reich. Ic.* t. 974; *Morren, Belg. Hort.* t. 49. fig. 1; *Eng. Bot.* 3rd edit. t. 1519. Bulbus globosus 4–6 lin. crassus membranaceo-tunicatus. Caulis erectus 9–15-pollicaris brunneo-iridis sæpissime uniflorus. Folia 4–5 distantia supra medium caulis imposita linearia ascendentia subglauca canaliculata 3–6 poll. longa  $1\frac{1}{2}$ –3 lin. lata. Perianthium cernuum inodorum 15–18 lin. longum vinoso-purpureum maculis albidis distincte tessellatum, venis saturate rubro-purpureis verticalibus utrinque costam 3, vel album venis viridibus, segmentis oblongis medio 6–9 lin. latis, interioribus latioribus basi spathulatis apice haud porrectis, omnibus 3–4 lin. supra basin sulco viridi lineari 5–6 lin. longo foveolatis. Antheræ lineares acutæ 3–4 lin. longæ filamentis sesqui breviores. Ovarium 4 lin. longum; stigmata 3 lin. longa, stylo subduplo breviora. Capsula globosa obtuse angulata 6–8 lin. longa et lata, collo distincto turbinato. *Ab Anglia et Norvegia per Europam centralem ad Caucasum et Bosniam.* Apud nos fine Aprilis floret. Formæ insigniores sunt *F. MAJOR*, *Bouché, Kunth, Enum.* v. 252, floribus majoribus segmentis magis patentibus; *F. ALBA*, *Parkins, Parad.* 41, t. 4, est forma albiflora; *F. FLORE DUPLICI ALBICANTE*, *Parkins, Parad.* 42, est forma floribus plenis albedo-purpureis leviter tessellatis; *F. PRÆCOX*, *K. Koch, Walp. Ann.* vi. 105, hortensis, caule viridi, foliis 6–8 latioribus, floribus albis 2–3; *BRACHYPODA*, *Baker*, hortensis, perianthio expanso subinfundibuliformi, segmentis viridulo tessellatis, filamentis antheris triplo brevioribus; et *FLAVIDA*, *Baker*, segmentis flavidis maculis paucis rubro-purpureis tessellatis (fortasse inter *Melagridem* et *luteam* hybrida hortensis habitu et foliis prioris).
2. *F. DELPHINENSIS*, *Gren. Flor. France*, iii. 180; *Parl. Ital.* ii. 412; *Walp. Ann.* iv. 107.—*F. tubæformis*, *Gren. et Godr. Mem. Soc. Emul. Doubs, May*, 1854. Bulbus globosus membranaceo-tunicatus 4–6 lin. crassus. Caulis  $\frac{1}{2}$ –1-pedalis sæpissime uniflorus. Folia 4–6, omnia supra medium caulis imposita, ascendentia plana 2–3-pollicaria, superiora linearia, inferiora oblanceolata interdum 3–4 lin. lata. Perianthium cernuum inodorum 15–21 lin. longum, vinoso-purpureum maculis flavidis sæpe obscuris tessellatum, venis pluribus saturatis utrinque costam, interdum albidum vel flavidum, segmentis oblongis obtusis rectis medio 6–9 lin. latis, interioribus latioribus, omnibus 3–4 lin. supra basin foveola lanceolata 3–4-lineari præditis. Antheræ flavæ 3 lin. longæ, filamentis vinosis sesqui breviores. Stylus 5–6

lin. longus apice solum leviter tricuspидatus. Capsula obovoideo-oblonga obtuse angulata 12-15 lin. longa. *Alpes Delphinatus et Saubaudia*.—F. LUTEA, Reich. Ic. t. 975, non Miller, est verisimiliter forma flaviflora hujus speciei.

Var. MOGGRIDGEI, Boiss. (*Moggridge, Cont. Ment. t. 25*), *Planch. Bull. Soc. France*, 1873, 116, est forma humilis latifolia (foliis interdum 6-9 lin. latis) flaviflora ex Alpibus Maritimis cuspidibus stigmatosis longioribus ad *F. luteam* accedens.

Var. BURNATI, *Planch. Bull. Bot. Frauce*, 1873, 115, ex Alpibus maritimis ad *Col. de Tende*, Bourgeau! &c., *Tirolensibus*, Huter! et *Corsica*, Dierck in hb. Moggridge! ad *F. tenellam* accedit perianthio minore late campanulato livide vinoso-purpureo et foveola minore.

Subgenus II. MONOCODON (*Salisb.*) *Bulbus* membranaceo-tunicatus. *Caulis* monocephalus vel oligocephalus. *Stylus* apice stigmatoso distincte tricuspидatus. *Segmenta* plus minusve distincte tessellata supra basin foveola oblonga vel ovata instructa.

3. F. TENELLA, *M. Bieb. Fl. Cauc.* i. 269; *Led. Ross.* iv. 146; *Reich. Germ.* 102; *Reich. Ic.* t. 977-9; *Belg. Hort.* t. 49. fig. 3.—*F. montana*, Hoppe, *Flora*, xv. 2, 476; *Koch, Syn.* edit. 1, 707; *Kunth, Enum.* iv. 249; *Parl. Fl. Ital.* ii. 410; *Mogg. Ment.* t. 66; *Belg. Hort.* t. 49. fig. 4.—*F. racemosa a. minor*, *Gawl. Bot. Mag.* t. 1216; *Kunth, Enum.* iv. 249.—*F. caussolensis*, *Goaty & Pons in Ardoino, Flor. Alp. Marit.* 375. *Bulbus* depresso-globosus 4-6 lin. crassus. *Caulis* 9-15-pollicaris, sæpissime uniflorus, foliis 5-8 supra medium caulis impositis anguste linearibus ascendentibus 2-3 poll. longis  $1\frac{1}{2}$ -3 lin. latis supremis geminatis, ab reliquis omnibus sparsis vel infimis oppositis remotis. *Perianthium* cernuum inodorum 9-12 lin. longum, segmentis oblanceolato-oblongis rectis 4-6 lin. latis saturate vinoso-purpureis, præsertim intus maculis viridibus tessellatis venis pluribus crebryis, prope basin nectario viridi rotundato foveolatis. *Antheræ* apiculatæ 2-3 lin. longæ filamentis sesqui vel duplo breviores. *Ovarium* 4 lin. longum; *stylus* 2 lin. longus cuspidibus stigmatosis subæquilongus. *Capsula* obovoidea 6-8 lin. longa, collo brevissimo. *In Alpibus maritimis, montibus Germaniæ littoralis, Austriæ et ditionis Caucasi*.—*F. ORSINIANA*, *Parl. Fl. Ital.* ii. 411, ex Apenninis centralibus dicitur differre habitu humiliore, floribus minoribus, perianthii segmentis apicem versus magis angustatis.—*F. RACEMOSA*, *Gawl. Bot. Mag.* t. 952, excl. syn. (*F. Gawleri, Jaub. & Spach, Ic.* t. 500), est verisimiliter forma hortensis floribus 3-6 racemosis, foliis 12-20, infimis lanceolatis 2-3-natis 5-6 poll. longis 9-12 lin. latis.

4. F. PONTICA, *Wahl. Isis*, xxi. 984; *Schult. Syst.* vii. 1687; *Kunth, Enum.* iv. 248; *Griseb. Rumel.* ii. 383.—*F. olympica*, *K. Koch, Linn.*

- xxii. 232; *Walp. Ann.* iii. 628. Bulbus globosus membranaceo-tunicatus. Caulis 1-1½-pedalis sæpissime monocephalus, foliis 6-8 supra medium impositis infimis oppositis lanceolatis 2-3 poll. longis 3-4 lin. latis, centralibus sparsis, supremis ternis angustioribus acutioribus. Perianthium campanulatum 12-15 lin. longum vinoso-purpureum flavo-viridi suffusum vix tessellatum, segmentis rectis obtusis oblanceolato-oblongis 3-4 lin. latis supra basin nectario lato parvo foveolatis. Genitalia perianthio subduplo breviora. Antheræ obtusæ 2 lin. longæ, filamentis ciliatis duplo breviores. Ovarium cylindricum 3 lin. longum; stylus 2½-3 lin. longus, stigmata triplo superans. Capsula alata. *In sylvis Bithyniæ, Thraciæ, Macedoniæ*, 0-2500 pedes, *Grisobach! Aucher-Eloy*, 2183!
5. *F. MESSANENSIS*, *Rafn. Précis*, 44; *Guss. Prod.* i. 410; *Synops.* i. 400; *Kunth, Enum.* iv. 248, ex parte; *Parl. Fl. Ital.* ii. 413, ex parte, non *Boiss. Voy. Esp.* 611. Bulbus globosus 4-6 lin. crassus. Caulis 1-1½-pedalis, mono- raro 2-cephalus, foliis 8-10 ascendentibus linearibus, infimis sparsis infra medium caulis impositis 3-4 poll. longis 3-4 lin. latis, supremis 1-1½ lin. latis longe acuminatis sæpissime ternis. Perianthium cernuum 15-20 lin. longum, segmentis rectis oblanceolato-oblongis 5-6 lin. latis, exterioribus acutioribus extus vinoso-purpureis vix tessellatis dorso late viridi carinatis intus viridibus paulo supra basin foveola ovata instructis. Antheræ apiculatæ 3 lin. longæ filamentis sesqui breviores. Ovarium 4 lin. longum; stylus 3 lin. longus, stigmata vix excedens. Capsula obovoideoglobosa ad pollicem longa obtuse angulata collo distincto. *Sicilia in fruticetis montosis prope Messinam, Calabria, &c.*, De *Heldreich! Swainson! Tineo! Huet du Pavillon*, 202! &c.
6. *F. REUTERI*, *Boiss. Diagn.* v. 57; *Walp. Ann.* 851. Bulbus membranaceo-tunicatus 3-4 lin. crassus. Caulis 6-9-pollicaris gracilis monocephalus, foliis 5-6, inferioribus linearibus 2-3 poll. longis medio 3-4 lin. latis, supremis multo minoribus ternis vel solitariis. Perianthium 7-9 lin. longum, segmentis vinoso-purpureis apice et intus flavido-viridibus oblongo-oblanceolatis obtusis 3-4 lin. latis longe supra basin obscure late foveolatis. Antheræ flavæ apiculatæ 2½ lin. longæ filamentis glabris sesqui breviores. Ovarium 2½ lin. longum; stylus 3 lin. longus, stigmata duplo superans. *Persia prope Ispahan*, *Aucher Eloy*, 5379!
7. *F. INVOLUCRATA*, *All. Auct.* 34; *Kunth, Enum.* iv. 249, ex parte; *Reich. Ic.* t. 980; *Parl. Fl. Ital.* ii. 413; *Gren. Fl. Franc.* iii. 180; *Mogg. Cont. Ment.* t. 36. Bulbus globosus 5-6 lin. crassus. Caulis pedalis et ultra monocephalus, foliis 6-9 supra medium caulis impositis, inferioribus oppositis, supremis sæpissime ternis, omnibus ascendentibus linearibus 2-4 poll. longis 3-4 lin. latis. Perianthium cer-

num 12-18 lin. longum, segmentis oblanceolato-oblongis obtusis rectis 4-6 lin. latis utrinque vinoso-purpureis vix tessellatis 3 lin. supra basin nectario parvo oblongo foveolatis. Antheræ apiculatæ  $2\frac{1}{2}$ -3 lin. longæ filamentis sesqui breviores. Stylus 3 lin. longus, stigmatibus duplo longior. Capsula obovoidea 9-15 lin. longa obtuse angulata collo turbinato. *Alpes Delphinatus et Sabaudia*. Var. *VERSICOLOR*, Baker, ex Alpibus maritimis (*Moggridge, Cont. Ment.* t. 36), est forma perianthio, more *F. Meleagris*, utrinque distincte tessellato. Planta Alpium maritimorum, teste Moggridge, distinguitur caule debili e basi flexuoso.

8. *F. ROYLEI*, Hook.  *Ic.* t. 860.—*F. verticillata*, Wall.  *Cat.* 5079, B, C, D;  *Royle, Ill.* 387, t. 92. fig. 2, non Willd.—*F. Gulielmi-Waldemarii*, Klotzsch,  *Reise, Wald.* 52, t. 92. Bulbus depresso-globosus 6-9 lin. crassus membranaceo-tunicatus. Caulis 1-2-pedalis apice 1-4-cephalus, foliis 10-25 omnibus sæpissime oppositis vel verticillatis, infimis infra medium impositis geminis lanceolatis obtusiusculis, centralibus linearibus 2-4 poll. longis 3-6 lin. latis acuminatis in verticillos 4-6-foliatos dispositis erecto-patentibus. Pedicelli cernui 3-4 lin. longi foliis linearibus 2-4 erectis nullo modo cirrosis bracteati. Perianthium campanulatum 15-21 lin. longum flavido- viridulo-purpureum facie vinoso-purpureo tessellatum, segmentis oblanceolato-oblongis obtusis rectis 6-9 lin. latis supra basin nectario lato distincto foveolatis. Stamina perianthio subduplo breviora, antheris linearibus 4 lin. longis filamentis sesqui vel duplo brevioribus. Ovarium 4-5 lin. longum; stylus ovario æquilongus stigmata triplo superans. Capsula obtuse angulata. *Regio temperata et alpina Himalayæ occidentalis (Ladak, Kashmir, Lahul, Kumaon, &c.)*, Royle! Thomson! Strachey et Winterbottom! Wallich! &c.

9. *F. CIRROSA*, D. Don,  *Prodr. Nep.* 51;  *Schult. fl. Syst.* vii. 397;  *Kunth, Enum.* iv. 253.—*F. verticillata*, Wall.  *Cat.* 5079 A, non Willd. Bulbus parvus ovoidens membranaceo-tunicatus. Caulis gracilis monocephalus 1-1½-pedalis foliis 8-10 anguste linearibus erecto-patentibus, infimis oppositis supra vel infra medium caulis inpositis 1-3 poll. longis 2-3 lin. latis, superioribus angustioribus sæpissime in verticillos duos trifoliatos distantes dispositis, 3 supremis ad florem approximatis apice leviter cirrosis. Perianthium late campanulatum 15-18 lin. longum vinoso-purpureum viridulo distincte tessellatum, segmentis oblanceolato- vel obovoideo-oblongis rectis obtusis 4-8 lin. latis supra basin nectario parvo oblongo conspicuo foveolatis, interioribus distincte latioribus. Stamina perianthio subduplo breviora, antheris flavis apiculatis 3 lin. longis filamentis pubescentibus duplo brevioribus. Ovarium 3-4 lin. longum; stylus 6-7 lin. longus apice leviter tricuspидatus. Capsula obovoidea 6-9 lin. longa obtuse angulata.

*Regiones temperatæ et alpinæ Himalayæ orientalis; Nepalia, Wallich! Sikkim, 11000-16000 pedes, Dr. Hooker!*

10. F. VERTICILLATA, *Willd. Sp.* ii. 91; *Wickst. Act. Holm.* ii. t. 5. fig. 4; *Led. Ic.* t. 2; *Schult. fil. Syst.* vii. 397, 1688; *Kunth, Enum.* iv. 252.—*F. leucantha, Fisch. Grah. Bot. Mag.* t. 3083; *Kunth, Enum.* iv. 253.—*F. scandens, Fisch. MSS.*—*F. altaica, Pallas, MSS.* Bulbus globosus 6-9 lin. crassus membranaceo-tunicatus. Caulis 1-1½-pedalis, sæpe 1- sed interdum 2-5-cephalus, foliis 20-40 subpatentibus omnibus oppositis vel verticillatis, infimis binis prope medium impositis linearibus vel lanceolatis 2-3 poll. longis 6-9 lin. latis, centralibus linearibus 4-8nis, supremis 1½-2 lin. latis ab floribus remotis apice distincte cirrosis. Pedicelli cernui foliis 2-4 ascendentibus 2-3 poll. longis anguste linearibus apice insigniter cirrosis bracteati. Perianthium late campanulatum 12-15 lin. longum albidum vel flavum basi viridulum nullo modo tessellatum purpureo punctatum, segmentis obtusis rectis 4-8 lin. latis supra basin nectario parvo lato 1½ lin. longo foveolatis, interioribus magis obovatis. Stamina perianthio duplo breviora, antheris obtusis flavidis 3 lin. longis filamentis duplo brevioribus. Ovarium 3-4 lin. longum; stylus ovario æquilongus, stigmata 3-4-plo superans. Capsula quadrangulata 9-12 lin. longa et lata angulis late alata. *Ad montes Altai.*
- Var. THUNBERGII.—*F. Thunbergii, Miquel, Ann. Mus. Lug. Bat.* iii. 155.—*Uvularia cirrosa, Thunb. Jap.* 136; *Kunth, Enum.* iv. 202.—*F. collicola, Hance, Seem. Journ.* viii. 76. Folia superiora sæpe sparsa. Antheræ 3-4 lin. longæ filamentis interdum æquilongæ. Stylus ovarium 1½-2-plo superans. *China, Fortune, 27; Tarrant (Hance, 1165), Japonia, Thunberg, Siebold.*
11. F. RUTHENICA, *Wickst. Act. Holm.* ii. 1821, 6, t. 5. fig. 2; *Schult. fil. Syst.* vii. 396; *Grah. in Sweet, Brit. Flow. Gard.* ser. ii. t. 343; *Kunth, Enum.* iv. 252; *Led. Ross.* iv. 148.—*F. verticillata, Bieb. Flor. Taur.* i. 268, non *Willd.*—*F. heterophylla, Soland. in hb. Mus. Brit.* Bulbus parvus globosus membranaceo-tunicatus. Caulis gracilis 1-2-pedalis apice 1-3-cephalus, foliis 6-20 omnibus sparsis anguste linearibus, infimis prope medium impositis 4-5 poll. longis 1½-2 lin. latis acuminatis, supremis ab floribus remotis apice sæpissime distincte cirrosis. Pedicelli conferte racemosi cernui 3-6 lin. longi, singuli foliis 2 vel pluribus lineari-subulatis 2-3 poll. longis ascendentibus apice insigniter cirrosis bracteati. Perianthium late campanulatum 12-15 lin. longum livide vinoso-purpureum obscure tessellatum, segmentis oblanceolato-oblongis acutiuseulis apice puberulis medio 3-4 lin. latis supra basin nectario oblongo distincte foveolatis. Stamina perianthio ultra duplo breviora, antheris obtusis 2 lin. longis filamentis subduplo brevioribus. Ovarium 3 lin. longum; stylus ovario paulo



brevior, stigmatibus æquilongus. Capsula acute angulata. *Sarepta, Caucasus, Alatau.*

12. *F. LUTEA*, *Miller, Dict.* edit. 8, No. 4; *M. Bieb. Taur. Cauc.* i. 269; *Pl. Ross.* i. 61; *Schult. Syst.* vii. 394; *Kunth, Enum.* iv. 250, *non Reich. Ic.* t. 975.—*F. latifolia*, var. *lutea*, *Bot. Mag.* t. 1538.—*F. rollina*, *Adam in Weber & Mohr, Beiträge*, i. 50. Bulbus parvus globosus membranaceo-tunicatus. Caulis  $\frac{1}{2}$ –1-pedalis sæpissime monocephalus, foliis 6–10 glaucis supra medium impositis, inferioribus sparsis oblanceolatis 6–12 lin. latis, superioribus linearibus sæpe oppositis vel ternis. Perianthium cernuum late campanulatum basi truncatum expansum 15–18 lin. latum 15–18 lin. longum flavum viridi venosum purpureo plus minusve suffusum, segmentis oblongo-oblanceolatis 5–8 lin. latis supra basin nectario viridi oblongo integro vel emarginato impresso foveolatis. Stamina perianthio subduplo breviora, antheris flavis vel purpurascensibus 3 lin. longis filamentis duplo brevioribus. Ovarium 4 lin. longum; stylus 5–6 lin. longus stigmata crassa 3–4-plo superans. Capsula obovoidea  $1\frac{1}{2}$ -pollicaris obtuse angulata. *Caucasus, in hortis nostris per diu culta.*
- Var. *LATIFOLIA*—*F. latifolia*, *Willd. Sp. Plant.* ii. 92; *Red. Lil.* t. 51; *Bot. Mag.* t. 853, 1207.—*F. esculenta*, *Adam in Weber & Mohr, Beiträge*, i. 52. Perianthium saturate vinoso-purpureum, viridulo vel flavido tessellatum. *Cum forma typica promiscue in locis natalibus et hortis.*—*F. GLAUDESCENS*, *Willd., Kunth, Enum.* iv. 250, est forma inter *luteam* et *latifoliam* media foliis sparsis; *F. LATIFOLIA*, *K. Koch, Walp. Ann.* vi. 106, ab planta nostra differt foliis viridibus; *F. AUREA*, *Schott, Æstr. Woch.* 1854, 137; *Walp. Ann.* vi. 106 (*Taurus Ciliciæ*, *Kotschy*), ab *lutea* dicitur differre foliis inferioribus sæpe verticillatis, tessellis crebrioribus obsoletioribus sæpe maculis vel lineolis tantum indicatis, segmentis 7–9-nervatis.
13. *F. PALLIDIFLORA*, *Schrenck, Enum. Songar.* 5; *Kunth, Enum.* iv. 251; *Led. Fl. Ross.* iv. 148; *Regel, Gartenflora*, t. 209. Bulbus globosus 4–6 lin. crassus membranaceo-tunicatus. Caulis monocephalus 6–9-pollicaris, foliis 6–9, infimis infra medium impositis oppositis vel alternis oblongo-lanceolatis obtusiusculis 2–3 poll. longis 9–12 lin. latis, supremis lanceolatis acuminatis sæpe 2–3-nis. Perianthium cernuum late campanulatum 15–18 lin. longum flavum intus maculis paucis purpureis, segmentis oblongo-oblanceolatis rectis obtusis 6–8 lin. latis supra basin nectario viridi oblongo profunde impresso foveolatis. Stamina perianthio triente breviora, antheris lineari-oblongis 3–4 lin. longis flavis apiculatis filamentis duplo brevioribus. Ovarium 3–4 lin. longum; stylus 5–6 lin. longus stigmata 3–4-plo superans. Capsula obovoidea acute angulata. *Siberia centralis meridionalis (Altai, Songuria, &c.), Mongolia ad montes Tian-schan, alt. 8000 pedes, Semenow!*

Var. PLURIFLORA, *Regel, Enum. Semenow*, p. 120, est forma 2-oligocephala.

14. F. MELEAGROIDES, *Patrin, in Schult. Syst. Veg.* vii. 395 (1829).

—F. minor, *Led. Fl. Alt.* ii. 34 (1830);  *Ic.* ii. 12, t. 130; *Grah. Bot. Mag.* t. 3280; *Kunth, Enum.* iv. 252.—F. longifolia, *Fisch. in herb. DC.* Bulbus globosus 4–6 lin. crassus membranaceo-tunicatus. Caulis gracillimus sæpissime monocephalus 1–2-pedalis foliis 3–6 supra medium impositis omnibus sparsis anguste linearibus acuminatis 2–3 poll. longis 1–2 lin. latis. Perianthium campanulatum 9–12 lin. longum, saturate vinoso-purpureum obscure tessellatum, segmentis oblanceolato-oblongis rectis obtusis medio 4–6 lin. latis supra basin nectario parvo foveolatis. Stamina perianthio duplo breviora, anthesi acutis 2 lin. longis filamentis triplo brevioribus. Ovarium 3–4 lin. longum; stylus  $1\frac{1}{2}$  lin. longus, stigmatibus æquilongus vel brevior. Capsula obovoidea 6–8 lin. longa obtuse angulata. *Siberia occidentalis ab montibus Altai ad Songariam.*

15. F. LUSITANICA, *Wikst. Act. Holm.* 1821, ii. 9, t. 5. fig. 1; *Schult.*

*Syst.* vii. 388; *Kunth, Enum.* iv. 248; *Boiss. Diagn.* ii. iv. 101.—F. Melagris, *Brot. Fl. Lusit.* i. 520, non *Linn.* Bulbus globosus membranaceo-tunicatus 5–6 lin. crassus. Caulis monocephalus gracilis 9–15-pollicaris. Folia 7–8 sparsa ascendente linearia acuminata, infima infra medium caulis imposita 3–4 poll. longa 3–4 lin. lata. Perianthium cernuum 9–12 lin. longum saturate vinoso-purpureum obscure tessellatum, segmentis oblanceolato-oblongis 4–6 lin. latis, paulo supra basin foveola oblonga instructis. Antheræ 2 lin. longæ filamentis duplo breviores. Ovarium 4 lin. longum; stigmata  $1\frac{1}{2}$ –2 lin. longa stylo duplo vel sesqui breviora. *Lusitania, Welwitsch!* Castello de Paiva!

Var. HISPANICA.—F. hispanica, *Boiss. & Reut. Diagn.* ii. iv. 101.—F.

messanensis, *Boiss. Voy. Esp.* i. 610; *Kunth, Enum.* iv. 248, *ex parte.* Caulis raro 2-cephalus. Folia numerosiora, sæpe 8–10, omnia sparsa prope medium caulis conferta, inferiora 3–6 lin. lata. Perianthium 12–16 lin. longum, interdum intus distincte tessellatum, segmentis 5–8 lin. latis exterioribus dorso viridi carinatis. Antheræ 3 lin. longæ. Stigmata stylo 2–3-plo breviora. *Hispania in regione alpina montium Sierra Nevada, Sierra de Guadarrama, &c.* Bourgeau! Boissier & Reuter! Ball! *In Pyrenæis prope L'heris, Philippe!*

Var. STENOPHYLLA.—F. stenophylla, *Boiss. & Reut. Diagn.* ii. iv. 100.

Folia 8–10 anguste linearia distantia, inferiora vix ultra  $1-1\frac{1}{2}$  lin. lata. Perianthium 9–12 lin. longum, saturate vinoso-purpureum vix tessellatum sed segmentis exterioribus dorso interdum distincte viridi vittatis. Stigmata stylo paulo breviora. *Lusitania, Welwitsch!* Castello de Paiva! Bourgeau! *Hispania, Webb!* Bourgeau! Hurst!

- F. lutea lancifolia lusitanica*, *Parkins. Parad.* 43, est forma floribus luteis rubello maculatis.
- VAR. *NEGLECTA*.—*F. neglecta*, *Parl. Fl. Ital.* ii. 416.—*F. messanensis*, *Reich. Ic.* t. 981-2.—*F. nervosa*, *Unio Itineraria*, anno 1829 *Exsic. non Willd.* Folia 8-10 distantia inferiora 4-5 poll. longa 3 lin. lata. Perianthium 15-18 lin. longum minus luridum vix tessellatum. Stigmata stylo paulo breviora. *Germania littoralis*, Visiani! Zohrab! &c.
- VAR. *ALGERIENSIS*, *Baker*. Folia 7-8 omnia distantia supra medium caulis imposita. Perianthium luridum haud tessellatum. *Algeria prope Oran*, Balansa 223! Bovè!
16. *F. PYRENAICA*, *L. Sp.* edit. i. 304; *Bot. Mag.* t. 664; *Reich. Ic.* t. 976; *Gren. Fl. Franc.* iii. 179; *Belg. Hort.* t. 49, fig. 4.—*F. pyrenaea*, *Parkins. Parad.* 41, t. 11 (1629).—*F. Meleagris*  $\delta$ , *Linn. Sp.* edit. i. 304.—*F. Meleagris*, *Lap. Abr.* 183.—*F. aquitanica* (*Clusius*), *Mill. Dict.* No. 2.—*F. nigra* (*Lobel*), *Mill. Dict.* No. 3; *Gawl. Bot. Mag.* sub t. 1538.—*F. nervosa*, *Willd. Enum.* 364; *Kunth, Enum.* iv. 251.—*F. racemosa*, *Kunth, Enum.* iv. 249 *ex parte*. Bulbus globosus membranaceo-tunicatus 4-6 lin. crassus. Caulis 1-1½-pedalis sæpissime monocephalus. Folia 6-10 sparsa ascendentia 2-3 poll. longa glauca subplana, superiora linearia 1-2 lin. lata, inferiora infra medium caulis imposita ligulata 3 vel in planta culta 6-9 lin. lata. Perianthium cernuum leviter foetidum 15-18 lin. longum extus saturate vinoso-purpureum maculis paucis obscuris viridibus intus nitide viridulum tessuris vinosis paucis, segmentis obovato-oblongis 5-6 vel interdum 7-9 lin. latis apice flore expanso porrectis interioribus latioribus basi deltoideis, omnibus prope basin foveola oblonga viridi 3 lin. longa instructis. Antheræ 3 lin. longæ, filamentis viridibus sesqui breviores. Ovarium 3-4 lin. longum; stigmata stylo sesqui breviora. Capsula late oblonga obtuse angulata 9-12 lin. longa, collo distincto turbinato. *Regio alpina montium Galliæ meridionalis et Hispaniæ borealis*. In hortis nostris diu culta; floret ad initium Maii, post *Meleagridem*.—*F. NIGRA*, *Miller*, est forma hortensis hujus speciei floribus 3-4, foliis 6-9 lin. latis.—*F. AQUITANICA*, *Miller*, est forma foliis infimis oppositis. VAR. *LUTESCENS*, *Lindl. MSS.*, est forma segmentis exterioribus dorso late flavido viridi carinatis.—*F. UMBELLATA*, *Mill. Dict.* 5 (*F. umbellifera*, *Parkins. Parad.* 41, t. 12) est fortasse forma luxurians hortensis floribus pluribus congestis "umbellatis."
17. *F. OLIVIERI*, *Baker*. Bulbus globosus tunicatus 6-9 lin. crassus. Caulis 1-1½-pedalis monocephalus. Folia 7-10 ascendentia glabra sæpissime sparsa, infima interdum lanceolata 3-3½ poll. longa 6-9 lin. lata, reliqua linearia acuta 3-4 poll. longa. Perianthium cernuum campanulatum 15-16 lin. longum, saturate vinoso-purpureum haud

tessellatum, segmentis obovato-oblongis semipollicem latis apice subdeltoides distincte puberulis supra basin nectario oblongo distincto 3-4 lin. longo foveolatis. Stamina perianthio duplo breviora, antheris 3-4 lin. longis filamentis applanatis valde puberulis sesqui brevioribus. Ovarium 4-4½ lin. longum; stylus 2 lin. longus stigmatibus æquilongus. *Persia ad montem Elwind*, Olivier in herb. DC. ! Ad *F. pyrenaicam* arcte accedit.

18. *F. ACMOPETALA*, *Boiss. Diagn.* vii. 104; *Walp. Ann.* i. 851. Bulbus 5-6 lin. crassus membranaceo-tunicatus. Caulis gracilis 1-2 pedalis monocephalus. Folia 6-9 ascendunt sparsa anguste linearia, inferiora 5-6 poll. longa 1½-2 lin. lata infra medium caulis imposita. Perianthium 15-18 lin. longum cernuum, segmentis oblanceolato-oblongis 5-6 lin. latis obtusis vel cuspidatis luride vinoso-purpureis vel deorsum viridibus. Antheræ 3 lin. longæ obtusæ filamentis pubescentibus duplo breviores. Ovarium 4 lin. longum. Stylus 4 lin. longus stigmata vix excedens. *In regione alpina montium Syriæ et Asiæ minoris*, Aucher-Eloy, 2181; Kotschy, iter cilicico-kurdicum, 87! Forbes, 623!—*F. LYCIA*, *Boiss. & Held. Diagn.* xiii. 20, ex descriptione, non potui distinguere.
19. *F. KOTSCHYANA*, *Herb. Bot. Reg.* xvii.; *Misc.* 43; *Walp. Ann.* i. 851. Bulbus membranaceo-tunicatus. Caulis pedalis monocephalus. Folia 4-6 ascendunt supra medium caulis imposita sparsa glauca linearia acuta, inferiora 3-4 poll. longa 4-6 lin. lata, suprema angustiora. Perianthium cernuum 15-18 lin. longum, vinoso-purpureum, utrinque concolor distincte tessellatum, segmentis oblongo-spathulatis apice porrectis medio 6-7 lin. latis prope basin fovea parva lata instructis. Antheræ luteæ 4-4½ lin. longæ filamentis æquilongæ. Capsula turbinata obtuse angulata. *Persia borealis in regione alpina montis Elbrus*, Kotschy, 507! *Wassula & Schadschan, alt. 5000-6000 pedes*, Buhse.
20. *F. GRÆCA*, *Boiss. & Sprun. Diagn.* vii. 104; *Walp. Ann.* i. 851; *Bot. Mag.* t. 5052.—*F. pyrenaica*, *Sibth. & Sm. Fl. Græc.* t. 328, non *L.* Bulbus depresso-globosus membranaceo-tunicatus 6-8 lin. crassus. Caulis 3-9-pollicaris flexuosus sæpissime monocephalus, foliis 4-8, infimis sæpissime alternis lanceolatis 2-4 poll. longis 3-6 lin. latis, superioribus linearibus acuminatis. Perianthium cernuum campanulatum 7-10 lin. longum luride vinoso-purpureum haud tessellatum, segmentis rectis oblanceolato-oblongis obtusis 4-5 lin. latis dorso sæpe viridi carinatis, interioribus distincte latioribus, omnibus supra basin nectario lato parvo foveolatis. Genitalia perianthio triente breviora. Antheræ flavæ obtusæ filamentis ciliatis 2-3plo breviores. Ovarium 2-2½ lin. longum; stylus 1½-2 lin. longus, stigmata paulo superans. *In montibus Atticæ (Hymettus, &c.)*, 1000-

- 4000 *pedes*. De Heldreich ! Orphanides !—F. *PLANTAGINIFOLIA*, *Lam. Ency.* ii. 250, ex “*Levant*,” ab icone Tournefortiana descripta, ex descriptione brevi ad *græcam* arte accedit, vel forsân eadem est.
21. F. *TRISTIS*, *Held. & Sart. in Boiss. Diag. ser. 2, iv. 104.*—Bulbus depresso-globosus membranaceo-tunicatus 4-6 lin. crassus. Caulis  $\frac{1}{2}$ -1-pedalis 1-2-cephalus foliis 6-10 supra medium impositis, infimis lanceolatis 3-4 poll. longis, 6-9 lin. latis, sæpe oppositis, reliquis sparsis minoribus angustioribus acuminatis. Perianthium subcernuum, infundibuliformi-campanulatum, 9-12 lin. longum, lividissime vinoso-purpureum haud tessellatum segmentis obtusis oblanceolato-oblongis utrinque concoloribus haud venosis supra basin nectario parvo lato foveolatis. Antheræ 2 lin. longæ flavæ filamentis duplo breviores. Ovarium 3 lin. longum, stylus 4 lin. longus, stigmatibus quadruplo superans. Capsula obovoidea obtuse angulata collo turbinato. *In montibus Atticæ (Parnes, Lycabettus, Hymettus) De Heldreich !*
22. F. *CONICA*, *Boiss. Diagn. vii. 105; Walp. Ann. i. 852.*—F. *tulipifolia*, *Bory & Chaub. Exp. Mor. 98, non M. B., teste Boissier.* Caulis 1-2-cephalus 6-18-pollicaris, foliis 5-10, infimis lanceolatis sæpe oppositis 1-3 poll. longis 12-16 lin. latis obtusis, superioribus sparsis linearibus 1-3 lin. latis. Perianthium infundibuliformi-campanulatum 8-9 lin. longum, segmentis oblongo-oblanceolatis 3-4 lin. latis nectario parvo foveolatis. Stamina perianthio subtriente breviora. Pistillum perianthio æquilongum, stylo ultra tertiam partem trifido ovario æquilongo. *In Peloponneso prope Navarino, Bory (non vidi).*
23. F. *GUICCIARDII*, *Held. et Sart. in Boiss. Diag. ser. 2, iv. 102.* Caulis 6-9-pollicaris, 2-5- raro 1-cephalus, foliis 7-11 sparsis confertis, infimis lanceolatis subobtusis 2 poll. longis 6-9 lin. latis, superioribus anguste linearibus  $1\frac{1}{2}$ -2 lin. latis. Perianthium campanulatum, 1 poll. longum, segmentis oblongo-spathulatis haud tessellatis dorso viridi fasciatis, exterioribus acutioribus angustioribus. Stamina perianthio duplo breviora, antheris filamentis glabris subæquilongis. Pistillum stamina superans, stylo fere ad medium trifido ovarium superante. *Ad cacumen montis Parnethos Atticæ, 4500 pedes, Guicciardi, &c. (non vidi).*
24. F. *HERMONTIS*, *Fenzl, in Kotschy Pl. Syr. Exsic. anno 1855, no. 184; Klatt, Hamb. Gartenzeit. xvi. 442.* Bulbus parvus membranaceo-tunicatus. Caulis flexuosus monocephalus 3-4-pollicaris, foliis 4-5 sparsis confertis infimis oblongo-lanceolatis acutis 2-3 poll. longis, 6-9 lin. latis supremis anguste linearibus. Perianthium subcernuum campanulatum 7-8 lin. longum segmentis vinoso-purpureis haud tessellatis dorso viridulis oblongo-oblanceolatis acutiusculis 3-4 lin. latis prope basin nectario lato foveolatis. Antheræ obtusæ filamentis ciliatis pallidis æquilongæ. Ovarium 2 lin. longum; stylus

- $1\frac{1}{2}$  lin. longus, stigmata paulo superans. *Palastina in cacumine montis Hermon, 9000-9500 pedes, Kotschy!* Lowne!
25. *F. CRASSIFOLIA, Boiss. & Huet, Diagn. ser. 2, iv. 103.* Bulbus depresso-globosus membranaceo-tunicatus 6-9 lin. crassus. Caulis 4-6-pollicaris sæpissime monocephalus, foliis 5-6 confertis sparsis supra medium impositis, infimis oblongo-spathulatis 2-3 poll. longis 6-9 lin. latis, superioribus linearibus acuminatis. Perianthium campanulatum subcernuum 9-12 lin. longum saturate vinoso-purpureum leviter tessellatum, segmentis rectis obtusis oblanceolato-oblongis 4-6 lin. latis supra basin nectario parvo lato foveolatis. Genitalia perianthio triente breviora. Antheræ  $1\frac{1}{2}$ -2 lin. longæ obtusæ filamentis ciliatis 2-3plo breviores. Ovarium 2-2 $\frac{1}{2}$  lin. longum, stylo æquilongum, stigmata 2-3plo superans. Capsula turbinata obtuse angulata. *In regione alpina montium Armenia, Aucher-Eloy, 2092! 2420! 5376! Huet du Pavillon! Calvert! Zohrab! Taurus, Kotschy! In cacumine Gebel el Cheik, Aucher-Eloy, 2180! Lycia, Mt. Cragus, Forbes, 622! Libanus, Aucher-Eloy, 290, in herb. DC.! Hayne!*
26. *F. KURDICA, Boiss. & Noé, Diagn. ser. 2, iv. 103.* Caulis monocephalus 2-3-pollicaris, foliis 5 omnibus sparsis, infimis lanceolatis  $1-1\frac{1}{2}$  poll. longis 4-5 lin. latis, supremis anguste linearibus. Perianthium circiter semipollicem longum, segmentis obtusiusculis purpureis tessellatis extus dorso viridi fasciatis, supra basin nectario ovato foveolatis. Genitalia perianthio triente breviora. Antheræ filamentis papillosis subduplo breviores. Stylus stamina leviter superans, fere ad medium trifidus. *In subalpinis Kurdistania prope Van, Noé (non vidi)!*
- Subgenus III. AMBLIRION (*Raf.*). *Bulbus* membranaceo-tunicatus. *Stylus* apice stigmatoso indivisus. *Caulis* sæpissime monocephalus. *Foveolæ* parvæ obscuræ æquales, carinales vel ovatæ.—*Eucrinum, Nuttall.*
27. *F. BITHYNICA, Baker.* Bulbum non vidi. Caulis subpedalis 2-cephalus triente inferiore nudo, foliis 10-12 ascendentibus sparsis, inferioribus lanceolatis 2 poll. longis 3-4 lin. latis, superioribus angustioribus. Pedicelli cernui foliis linearibus bracteati. Perianthium flavum 1 poll. longum, segmentis oblanceolatis obtusis rectis haud tessellatis, 3 lin. latis nectario obscuro supra basin foveolatis. Stamina perianthio duplo breviora, antheris obtusis 2 $\frac{1}{2}$  lin. longis filamentis pilosis paulo longioribus. Ovarium 3 lin. longum, stylo recto indiviso paulo brevius. *Bithynia in Monte Olympe, Noé!*
28. *F. FORBESII, Baker.* Bulbus globosus 4-5 lin. crassus membranaceo-tunicatus. Caulis 1-2-pedalis monocephalus gracillimus, foliis

- 6-10 supra medium impositis sparsis linearibus distantibus 4-5 poll. longis 1-3 lin. latis ascendentibus acuminatis. Perianthium cernuum infundibuliformi-campanulatum 9-12 lin. longum pallide vinoso-purpureum haud tessellatum, primum extus viridulum, segmentis rectis oblanceolatis obtusis medio 2-2½ lin. latis prope basin obscure foveolato-carinatis. Stamina perianthio subduplo breviora, antheris obtusis filamentis pubescentibus duplo brevioribus. Ovarium 2-2½ lin. longum; stylus 3 lin. longus indivisus puberulus. *Lycia in dumetis rupestribus ad Macri*, E. Forbes, 626! Elwes!
29. F. GARDNERIANA, *Wall. Cat.* No. 5080. Bulbum non vidi. Caulis 9-18-pollicaris monocephalus foliis 9-15 omnibus sparsis ascendentibus linearibus 2-6 poll. longis 1½-2 lin. latis, infimis parvis prope basin impositis. Perianthium cernuum 1 poll. longum, segmentis oblongo-oblanceolatis 4-6 lin. latis acutiusculis pallidis haud tessellatis facie triente inferiore punctis crebris saturate purpureis sparsis nectario obscuro carinali foveolatis. Stamina perianthio vix duplo breviora, antheris obtusis 2 lin. longis filamentis triplo brevioribus. Ovarium 4 lin. longum; stylus ovario paulo brevior, indivisus, apice stigmatoso capitatus. *Nepalia ad montem Gossain Than*, Gardner! *Sikkim, regio temperata*, 9000-10,000 pedes, Dr. Hooker!
30. F. PINARDI, *Boiss. Diagn.* vii. 106; *Walp. Ann.* i. 852.—Theresia Pinardi, *Klatt, Hamb. Gartenzeit.* xvi. 439. Bulbus parvus membranaceo-tunicatus. Caulis semipedalis gracilis sæpe monocephalus foliis 5-7 ascendentibus omnibus sparsis, inferioribus lanceolatis 1½-2 poll. longis, 3-4 lin. latis, superioribus linearibus sensim acuminatis. Perianthium cernuum 8-9 lin. longum, segmentis oblongo-oblanceolatis 3-3½ lin. latis obtusis haud tessellatis, exterioribus saturate purpureis apice viridibus, interioribus pallidioribus, omnibus intus flavo-viridibus supra basin nectario parvo lato foveolatis. Anthera 2 lin. longæ mucronulatæ filamentis pubescentibus sesqui breviores. Ovarium cylindricum 2 lin. longum stylo integro duplo brevius. *Caria*, Pinard!
31. F. ASSYRIACA, *Baker*. Bulbus globosus 3-4 lin. crassus membranaceo-tunicatus. Caulis ½-1-pedalis gracilis monocephalus, foliis 4-6 supra medium impositis, sæpissime sparsis, infimis oblanceolatis 2-4 poll. longis 3-5 lin. latis, superioribus linearibus. Perianthium anguste campanulatum 6-7 lin. longum vinoso-purpureum vix tessellatum segmentis oblanceolatis 2 lin. latis nectario obscuro foveolatis. Stamina perianthio triente breviora, antheris obtusis 1½ lin. longis filamentis applanatis pubescentibus triplo brevioribus. Ovarium 3 lin. longum; stylus ovario æquilongus apice obscure trilobatus. *Assyria in dumetis supra Terck*, Haussknecht!
32. F. EHRLHARTI, *Boiss. et Grph. Diag.* ii. iv. 105. Caulis humilis

monocephalus, foliis 6-8 supra medium impositis, inferioribus confertis oblongo-lanceolatis, infimis oppositis, supremis sparsis anguste linearibus. Perianthium obconicum basi vix gibbosum, segmentis saturate purpureis apice flavis obtusis ciliatis. Stamina perianthio triente breviora antheris muticis filamentis glabris paulo brevioribus. Ovarium cum stylo indiviso stamina superans, perianthio paulo brevius. *Insula Syra, Orphanides (non vidi).*

33. *F. FLEISCHERI*, *Steud. & Hochst. Unio Itin.* 1827, *Exsic.*; *Kunth, Enum.* iv. 248.—*F. Fleischiana, Schult. Syst.* vii. 388.—*Theresia Fleischeri, Klatt, Hamb. Gartenzeit.* xvi. 439. Bulbus globosus membranaceo-tunicatus 3-4 lin. crassus. Caulis gracilis flexuosus monocephalus 3-6-pollicaris, foliis 5-6 supra medium caulis impositis linearibus ascendentibus 6-12 lin. longis  $\frac{1}{2}$ -1 lin. latis, infimis interdum oppositis interdum sparsis supremum ab flore remotum. Perianthium subcernuum 7-8 lin. longum livide vinoso-purpureum nullo modo tessellatum, segmentis oblanceolatis 2-2 $\frac{1}{2}$  lin. latis supra basin nectario parvo oblongo foveolatis. Stamina segmentis paulo breviora, antheris obtusis 2 lin. longis filamentis duplo brevioribus. Ovarium cylindricum 2 lin. longum, stylo recto indiviso duplo brevius. Capsulam non vidi. *Smyrna in collibus argillosis sylvaticis in Februario florens, Fleischer!*

34. *F. TULIPIFOLIA*, *M. Bieb. Fl. Taur. Cauc.* i. 270; *Pl. Ross.* t. 21; *Kunth, Enum.* iv. 247 ex parte; *Hook. fl. Bot. Mag.* t. 5969.—*Theresia tulipifolia, Klatt, Hamb. Gartenzeit.* xvi. 439, *excl. syn.* Bulbus globosus membranaceo-tunicatus 4-6 lin. crassus. Caulis gracilis flexuosus  $\frac{1}{2}$ -1-pedalis sæpissime monocephalus, foliis glaucis 2-4 sparsis supra medium impositis, infimis lanceolatis 1 $\frac{1}{2}$ -3 poll. longis medio 6-9 lin. latis, superioribus multo minoribus linearibus acuminatis. Perianthium 8-12 lin. longum, magis infundibuliforme quam in speciebus reliquis livide vinoso-purpureum haud tessellatum, segmentis oblanceolatis acutiusculis medio 2 $\frac{1}{2}$ -3 lin. latis prope basin nectario parvo foveolatis. Stamina segmentis paulo breviora, antheris obtusis filamentis glabris duplo brevioribus. Ovarium cylindricum 3 lin. longum, stylo indiviso interdum leviter exserto duplo brevius. Capsula obovoidea obtuse angulata. *Caucasus, in regione alpina, Fischer! Hohenacker! Szovits! Armenia, Huet du Pavillon! Calvert! Zohrab! Kurdistan, Olgum! F. ARMENA, Boiss. Diagn.* vii. 106 (*Armenia, Aucher-Eloy, 5377!*) est verisimiliter forma mera hujus speciei foliis angustioribus, stylo apice obscure trilobato. *F. OBLIQUA, Gawl. Bot. Mag.* t. 857, est verisimiliter forma hortensis robustior foliis numerosioribus.

Var. *DASYPHYLLA, Baker.* Caulis 3-4-pollicaris, foliis 4-5 confertis, infimis lanceolatis vel oblongis. Genitalia perianthio pallidiora di-



stincte breviora. Stylus ovario duplo longior. *Lycia, prope Cybriam, E. Forbes, 621!* Elwes!

Var. *KOTSCHYI, Baker.* Caulis 3-4-pollicaris, foliis 4-5 lanceolatis haud confertis. Perianthium vinoso-purpureum haud lividum. Genitalia perianthio triente breviora, stylo 3 lin. longo, apice obscure lobato, ovario vix longiore. *In monte Tauro, Kotschy, anno 1838, No. 507!*

35. *F. PUDICA, Spreng. Syst. ii. 64; Kunth, Enum. iv. 255; Wood, Proc. Acad. Phil. 1868, 167; S. Wats. Bot. 40, Parall. 347.—Lilium? pudicum, Pursh, Flora, i. 288, t. 8; Schult. Syst.' vii. 401.—Amblirion pudicum, Rafn. Journ. Phys. 89. 102.—Theresia pudica, Klatt. Hamb. Gart. xvi. 439.* Bulbus depresso-globosus membranaceo-tunicatus 4-6 lin. crassus. Caulis gracilis 3-9-pollicaris sæpe monocephalus, foliis 3-6 supra medium impositis, infimis ligulatis obtusis 2-3 poll. longis 2-3 lin. latis sæpe oppositis, reliquis sparsis linearibus. Perianthium cernuum infundibuliforme 6-12 lin. longum pallide vel saturate flavum vel raro purpureum nullo modo tessellatum, segmentis oblanceolato-oblongis obtusis 2-3 lin. latis, ad basin nectario obscure carinali foveolatis. Genitalia perianthio paulo breviora. Antheræ flavæ  $1\frac{1}{2}$  lin. longæ, filamentis glabris triplo breviores. Ovarium 2-3 lin. longum, stylus indivisus ovarium superans. Capsula obovoidea 8-12 lin. longa obtuse angulata collo magno turbinato. *Montes Scopulosi Americæ borealis (Washington, Oregon, Nevada, Utah, 5000-6000 pedes alt.), Douglas! Geyer, 315! &c.*

Subgenus IV. *KOROLKOWIA (Regel).* Bulbus membranaceo-tunicatus. Flores racemosi, perianthio subinfundibuliformi, segmentis e basi ad medium carinato-foveolatis, carina segmenti superioris profundioré. Stylus indivisus.

36. *F. SEWERZOWI, Regel, Enum. Pl. Semenow. No. 1057.—Korolkowia Sewerzowi, Regel, Animad. (1873) 17; Gartenflora, t. 760.* Bulbus globosus 12-15 lin. crassus tunicatus e basi propagulas filiformes laxè squamosas apice foliolis filiformibus vestitas emittens. Caulis 1- $1\frac{1}{2}$ -pedalis, foliis pluribus sparsis supra medium impositis, infimis lorato-lanceolatis pollicem latis interdum oppositis, superioribus lanceolatis 3-4 poll. longis. Flores 6-10 laxè racemosi, pedicellis apice cernuis 3-6 lin. longis, basi foliis flores multo excedentibus bracteatis. Perianthium 12-15 lin. longum viridulum haud tessellatum extus vinoso tinctum, segmentis oblanceolatis 3-4 lin. latis triente superiore patulis, foveola carinali obscura. Stamina perianthio paulo breviora, filamentis purpureis, antheris oblongis viridibus acutis. Stylus indivisus ovario æquilongus staminibus brevior. *In montibus Turcomaniæ, 3000-6000 pedes, Korolkow.*

Subgenus V. RHINOPETALUM (*Fisch.*). *Bulbus* membranaceo-tunicatus. *Flores* racemosi haud tessellati. *Foveolæ* parvæ, profundæ, dorso segmentorum, gibbosæ, segmenti superioris magis saccatæ. *Stylus* indivisus.

37. F. KARELINI, *Baker*.—*Rhinopetalum* Karelini, *Fisch. Edin. New Phil. Journ.* 1830, 19; *D. Don, Sweet, Flow. Gard.* t. 283; *Kunth, Enum.* iv. 256.—*Fritillaria* gibbosa, *Boiss. Diagn.* vii. 107; *Walp. Ann.* i. 852.—*Rhinopetalum* Boissieri, *Klatt, Hamb. Gart.* xvi. 439.—*F. pterocarpa*, *Stocks in Hook. Kew Journ.* iv. 180. *Bulbus* ovoideus membranaceo-tunicatus 6–12 lin. crassus. *Caulis* 3–6-pollicaris apice racemosus. *Folia* infra racemum 4–6 opposita vel alterna, infima oblanceolata 2–3 poll. longa, superiora linearia. *Racemus* densus 2–12-florus, axi puberulo, pedicellis floriferis cernuis 3–6 lin. longis, foliis parvis linearibus bracteatis. *Perianthium* late campanulatum lilacinum venis verticalibus saturatoribus, haud tessellatum, 6–8 lin. longum, segmentis oblanceolatis acutis medio 2 lin. latis supra basin nectario profunde saccato foveolatis, dorso distincte gibbosis, gibbo segmenti supremo profundiore. *Stamina* perianthio paulo breviora, antheris subglobosis  $\frac{1}{2}$  lin. longis, filamentis ciliatis declinatis. *Ovarium*  $1\frac{1}{2}$  lin. longum, stylo curvato integro subduplo brevius. *Capsula* depresso-globosa-quadrangula 5–6 lin. longa, interdum 9–10 lin. lata, obtuse angulata, collo turbinato. *Siberia centralis et orientalis meridionalis, Turcomania, Persia, Kotschy, 827! Afghanistan, Griffith, 5791! Beloochistan, Stocks, 918!*

Subgenus VI. NOTHOLIRION (*Wall.*). *Bulbus* membranaceo-tunicatus. *Flores* plurimi racemosi, genitalibus perianthio subæquilongis. *Stylus* apice stigmatoso tricuspidatus. *Capsula* obtuse angulata. *Perianthium* nullo modo tessellatum. Inter *Lilium* § *Eulirion* et *Fritillariam* ambigit; perianthium infundibuliforme concolor nectario obsoleto carinali, et genitalia elongata leviter declinata prioris; bulbus scarioso-tunicatus et stylus apice distincte tricuspidatus posterioris.

38. F. MACROPHYLLA, *D. Don, Prod. Nep.* 51 (1825); *Schult. Syst.* vii. 399; *Kunth, Enum.* iv. 253.—*Lilium* roseum, *Wall. Cat.* 5077 (1832); *Hook. Bot. Mag.* t. 4725; *Belg. Hort.* 1853, t. 21.—*Fritillaria* Thomsoniana, *D. Don in Royle, Ill.* 388, t. 92 (1839); *Kunth, Enum.* iv. 672.—*Lilium* Thomsonianum, *Lindl. Bot. Reg.* vol. xxxi. (1845) tab. 1; *Spæe, Mon.* 9; *Walp. Ann.* i. 852; *Rev. Hort.* 1868, t. 231.—*L. longifolium*, *Griff. Icones*, t. 277; *Itin.* 345. *Bulbus* ovoideo-cylindricus 1 poll. crassus tunicis scariosis pluribus 2 poll. vel ultra longis, exterioribus striatis cinctus in axillis bulbiferis.

Caulis  $1\frac{1}{2}$ -3-pedalis erectus teres glaber. Folia 20-30 ascendentia linearia, in axillis bulbifera, inferiora crebra 12-18 lin. longa 3-4 lin. lata, superiora breviora laxiora. Racemus 12-18 poll. longus, 6-30-florus, expansus 3-4 poll. latus, floribus inferioribus cernuis, superioribus minoribus ascendentibus. Bractea solitaria linearis 9-18 lin. demum sæpe 2-3 poll. longæ. Perianthium infundibuliforme roseo-lilacinum odorum 18-24 lin. longum nullo modo tessellatum, segmentis oblanceolatis longe supra medium 3-4 lin. latis apice patulis, longe unguiculatis, prope basin albido-purpureo carinatis. Filamenta filiformia segmentis paulo breviora; antheræ albido-lilacinæ 3-4 lin. longæ polline flavo. Ovarium 4-5 lin. longus; stylus filiformis 15-18 lin. longus, stigmatibus parvis recurvato-patentibus. Capsula ovoideo-oblonga 12-15 lin. longa obtuse 6-angulata apice umbilicata distincte 6-umbonata. *Afghanistan*, Griffith, 5796! *Regio subtēperata Himalayæ occidentalis*, Wallich! Royle! Strachey and Winterbottom! *In Nepalia ad montem Gossain Than*, Wallich! De bulbis vide Duchartre, *Ann. Sc. Nat.* sér. 5, tom. xvi. 326, t. 15-17.

39. F. *HOOKERI*, Baker.—Lilium (Notholirion) Hookeri, Baker, *Gard. Chron.* 1871, 201. Bulbus ovoideus scarioso-tunicatus 6-9 lin. crassus. Caulis  $1-1\frac{1}{2}$ -pedalis apice racemosus. Folia 6-10 sparsa linearia ascendentia, inferiora 5-6 poll. longa 3-4 lin. lata, superiora sensim breviora et angustiora. Racemus latus secundus 3-8-florus, 3-6-pollicaris, bracteis foliaceis linearibus, infimis 1-2 poll. longis, pedicellis 3-9 lin. longis, floriferis subcernuis, fructiferis ascendentibus, floribus supremis multo minoribus. Perianthium roseo-lilacinum haud tessellatum, 9-15 lin. longum infundibuliforme segmentis oblanceolatis obtusis supra medium 3-4 lin. latis nectario obscuro carinali basali. Filamenta declinata segmentis paulo breviora, antheris obtusis 2 lin. longis. Ovarium cylindricum 5-6 lin. longum; stylus 6-8 lin. longus, stigmatibus 1 lin. longis filiformibus recurvato-patentibus. Capsula oblonga 6-8 lin. longa apice umbilicata. *Sikkim Himalaya, regio temperata, alt. 9000-10000 pedes*, Dr. Hooker!

Subgenus VII. *THERESIA* (K. Koch). *Bulbus squamosus. Stylus indivisus. Flores sæpissime plures racemosi, foveolis parvis latis æqualibus leviter saccatis.*—*Lyperia, Salisb. Tozzettia, Parlatore.*

40. F. *PERSICA*, Linn. *Sp.* 436; *Red. Lil.* t. 67; *Bot. Mag.* t. 1537; *Kunth, Enum.* iv. 247.—*Theresia persica*, K. Koch, Linn. xxii. 233. Bulbus squamosus pro genere magnus, albidus globosus inodorus perennis. Caulis 2-3-pedalis robustus apice racemosus, foliis 40-60 sparsis obliquis erecto-patentibus glaucis linearibus 4-6 poll. longis medio 6-9 lin. latis acuminatis, infimis interdum oppositis. Racemus

10-50-florus confertus 3-6 poll. longus, pedicellis cernuis foliis reductis linearibus bracteatis. Perianthium campanulatum leviter odorum 6-9 lin. longum lilacino-purpureum haud tessellatum, segmentis oblanceolatis rectis obtusis  $1\frac{1}{2}$ -2 lin. latis nectario lato parvo viridi prope basin foveolatis. Stamina perianthio paulo breviora, antheris oblongis 1 lin. longis purpureis, filamentis viridibus quadruplo brevioribus. Stylus viridis indivisus ovario subæquilongus. Capsula quadrangulata obtuse angulata. *Ex Oriente in hortis perdiu culta ad finem Aprilis vel initium Maii florens.* Var. MINOR, Sims, *Bot. Mag.* t. 962 (*excl. syn.*), est forma floribus minoribus antheris interdum subexsertis.

41. F. LIBANOTICA, Baker.—Theresia libanotica, Boiss. *Diagn.* xiii. 20. Bulbus squamosus pro genere magnus. Caulis 2-3-pedalis robustus apice racemosus, foliis 40-60 sparsis lanceolatis glaucis 3-4 poll. longis 6-9 lin. latis interdum oppositis vel ternis. Racemus 6-30-florus, expansus  $2\frac{1}{2}$ -3 poll. latus. Pedicelli cernui, foliis parvis bracteati. Flores odore gravi. Perianthium campanulatum 6-9 lin. longum pallide lilacinum venis verticalibus ramosis saturatioribus, segmentis rectis oblanceolato-oblongis late imbricatis 3-4 lin. latis prope basin nectario lato parvo foveolatis. Stamina perianthio triente breviora, antheris purpurascensibus obtusis 1 lin. longis, filamentis dodrante brevioribus. Stylus indivisus cum ovario æquilongo staminibus brevior. Capsula globoso-quadrangulata obtuse 6-angulata 6-9 lin. longa, 10-12 lin. crassa. *Palæstina in lapidosis umbrosis regionis mediæ Libani*, Boissier! Kerek, Dr. Roth! *Esdraelon*, Dr. Lowne! *Nain*, Hayne! *El Meain*, Post!—F. Reygassei, Boiss. et *Blanche*, *Excis.*, ex exemplis visis non potui distinguere.
42. F. PLURIFLORA, Torrey, Benth. *Pl. Hartweg.* 338. Bulbus magnus  $1\frac{1}{2}$  poll. crassus squamis copiosis crassis bulbiformibus cinctus. Caulis 1- $1\frac{1}{2}$ -pedalis robustus apice racemosus, foliis 8-12 ascendentibus prope medium aggregatis, infimis sæpissime oppositis oblanceolatis 4-5 poll. longis 6-9 lin. latis obtusiusculis, reliquis sparsis angustioribus acutis. Racemus 4-12-florus deorsum laxus, pedicellis ascendentibus 6-18 lin. longis foliis linearibus bracteatis, inferioribus apice subcernuis, superioribus erectis. Perianthium infundibuliformi-campanulatum 9-12 lin. longum roseo-purpureum nullo modo tessellatum, segmentis oblanceolatis obtusis supra medium  $2\frac{1}{2}$ -3 lin. latis dimidio inferiore nectario viridi carinali obscuro foveolatis. Stamina perianthio triente breviora, antheris obtusis flavis  $1\frac{1}{2}$ -2 lin. longis filamentis triplo brevioribus. Ovarium 3 lin. longum; stylus indivisus ovarium duplo superans, stigmate capitato. Capsulam non vidi. *California*, Fremont, 213! Hartweg, 1981!

Subgenus VIII. GONIOCARPA, Baker. *Bulbus* parvus, squamis

crassis cinctus. *Flores* solitarii vel pauci, foveolis obscuris æqualibus. *Stylus* apice distincte tricuspидatus. *Capsula* acute angulata.

43. *F. DAGANA*, Turcz. *Cat. Baic.* No. 1139; *Flor. Baic.* ii. 211; *Led. Ross.* iv. 148; *Traut. Imag.* 7, t. 1.—*Imperialis dagana*, Turcz. *Mosc. Bull.* 1838, i. 102.—*F. chamarensis*, Turcz. *MSS. olim.* Bulbus globosus 5-6 lin. crassus squamis paucis carnosis cinctus. Caulis monocephalus raro 2-cephalus 1-1½-pedalis, foliis 3-7, 2-6 ad medium verticillatis linearibus vel lanceolatis 2-3 poll. longis 2-6 lin. latis, supremo ad basin pedicelli cernui imposito. Perianthium campanulatum 12-18 lin. longum vinoso-purpureum distincte tessellatum, segmentis obtusis oblanceolato-oblongis supra basin obscure foveolatis. Stamina perianthio sub dimidium breviora, antheris obtusis filamentis glabris dodrante brevioribus. Ovarium 3-4 lin. longum; stylus 4-5 lin. longus stigmata falcata dimidio superans. Capsula quadrangulata 7-9 lin. longa acute angulata collo brevi turbinato, apice umbilicata. *Sibiria centralis meridionalis in pratis subalpinis*, Turczaninow!

44. *F. ALBA*, Nuttall, *Gen.* 222; *Schult. Syst.* vii. 399; *Kunth, Enum.* iv. 254.—*Ambliion album*, Sweet, *Hort. Brit.* 538. Bulbus parvus subsquamosus. Folia glaucescentia remotiuscula sparsa obliqua planiuscula linearia fere 2 poll. longa, 2 lin. lata. Flores 1-5 racemosi albi majusculi. Capsula obovoidea acute angulata. *Montes Scopulosi prope Fort Mandan*, Nuttall. (Non vidi. Deest in herbario Nuttalliano in hb. Mus. Brit., nisi forma albiflora *F. lanceolatae* est.)

45. *F. LANCEOLATA*, Pursh, *Flora*, i. 230 (*excl. syn.*); *Hook. Flor. Bor. Am.* ii. 181, t. 193; *Kunth, Enum.* iv. 255 (*excl. syn.*); *Torrey, Bot. Mex. Bound.* t. 61.—*F. esculenta*, Nuttall, *MSS.*—*Ambliion lanceolatum*, Sweet, *Hort. Brit.* 538. Bulbus 9-12 lin. crassus globosus squamis crassis cinctus. Caulis 1-1½-pedalis 1-3-cephalus supra medium foliis 4-10 impositis lanceolatis 2-4 poll. longis 3-9 lin. latis in verticillis 1-2 3-4-foliatis dispositis vel superioribus sparsis. Pedicelli cernui foliis linearibus vel lanceolatis 1-2 poll. longis bracteati. Perianthium late campanulatum 12-15 lin. longum livide vinoso-purpureum sæpissime distincte tessellatum, segmentis oblanceolato-oblongis obtusiusculis 3-4 lin. latis ad basin nectario magno oblongo viridi foveolatis. Stamina perianthio triente breviora, antheris apiculatis 1½-2 lin. longis, filamentis 3-4plo brevioribus. Ovarium 3 lin. longum; stylus 2-3 lin. longus, stigmatibus falcatis brevior. Capsula quadrangulata 8-9 lin. longa et lata acute 6-angulata. *Insula Vancouver, Columbia britannica, Oregon, California, Douglas!* Lyall! Menzies! Hartweg, 2005! Geyer, 599! &c.—*F. viridia, Kellogg, Proc. Acad. Calif.* ii. 9, est forma floribus viridulis.—*F.*

mutica, *Lindl.* (*Bot. Reg.* sub t. 1663), *Kunth* (*Enum.* iv. 253), est forma elatior verticillis foliorum interdum 3, floribus 3-6. Forma adest in herbario Nuttalliano floribus albis.

46. *F. PARVIFLORA*, *Torrey, Bot. Whipple*, 90; *Wood, Proc. Phil. Acad.* 1868, 166. Bulbus ovoideus 6-9 lin. crassus squamis crassis bulbiformibus cinctus. Caulis 1-1½-pedalis, apice racemosus, supra medium foliis circiter 9 linearibus 2-3 poll. longis impositis, infimis vel omnibus verticillatis. Racemus 5-20-florus. Pedicelli cernui 3-6 lin. longi foliis linearibus bracteati. Perianthium campanulatum 6 lin. longum vinoso-purpureum haud tessellatum viridulo suffusum, segmentis oblanceolatis rectis obtusis medio 1½-2 lin. latis prope basin nectario obscuro oblongo foveolatis. Stamina perianthio triente breviora, antheris 1½ lin. longis filamentis duplo brevioribus. Ovarium 2 lin. longum; stylus 1½ lin. longus, stigmatibus falcatis æquilongus. Capsula acute angulata. *California*, Bigelow!

47. *F. ATROPURPUREA*, *Nutt. Journ. Acad. Phil.* vii. 54; *S. Wats. Bot.* 40 *Parall.* 346. Bulbus depresso-globosus 6-9 lin. crassus squamis paucis carnosissimis cinctus. Caulis 1-2-pedalis, apice 1-6-florus, foliis 12-20 supra medium impositis sparsis vel infimis oppositis ascendentibus linearibus 2-4 poll. longis 1-1½ lin. latis acutis vel obtusiusculis sæpe purpureo tinctis. Flores racemosi, secundi, foliis 1-2 poll. longis reliquis omnino similibus bracteati. Perianthium campanulatum 6-9 lin. longum saturate vinoso-purpureum viridulo obscure tessellatum, segmentis obtusis oblanceolatis 2-2½ lin. latis unguibus obscure foveolatis. Stamina perianthio triente breviora, antheris oblongis obtusis 1 lin. longis filamentis quadruplo brevioribus. Ovarium 2-3 lin. longum; stylus ovario et stigmatibus late falcatis æquilongus. Capsula erecta 6-12 lin. longa quadrangulata acute angulata apice umbilicata. *Montes Scopulosi America borealis*, 5000-9500 *pedes*, Nuttall! Geyer, 273! Burke!

Subgenus IX. *LILIORHIZA* (*Kellogg*). *Bulbus* squamis pluribus crassis cinctus. *Stylus* apice stigmatoso tricuspidatus. *Flores* sæpissime racemosi, foveolis leviter impressis. *Capsula* obtuse angulata.—*Sarana, Fischer*.

48. *F. RECURVA*, *Benth. Pl. Hartweg*. 340; *Wood, Proc. Acad. Phil.* 1868, 167. Bulbus squamosus 9-12 lin. crassus. Caulis 1-2-pedalis, foliis 7-15 prope medium aggregatis linearibus ascendentibus acuminatis 3-4 lin. longis 2-3 lin. latis, 6-8 infimis in verticillis duobus dispositis, reliquis sparsis ab floribus remotis. Racemus latus subsecundus 3-8-florus. Pedicelli 3-12 lin. longi, ascendentes vel apice cernui, foliis 2-3 poll. longis bracteati. Perianthium 12-18 lin. longum, anguste

campanulatum vinoso-purpureum utrinque distincte albedo- vel flavido-tessellatum, segmentis oblanceolatis supra medium 2-3 lin. latis apice patulis acutiusculis, prope basin nectario obscuro carinali foveolatis. Stamina perianthio paulo breviora, antheris oblongis obtusis  $1\frac{1}{2}$  lin. longis filamentis 6plo brevioribus. Ovarium 3 lin. longum; stylus 6-7 lin. longus apice leviter tricuspидatus. Capsula obtuse angulata. *California*, Hartweg, 2007! Jeffray, 1061! Fremont, 348! 1846! Bigelow! *Nevada*, Hort. Leichtlin!

49. *F. LILIACEA*, *Lindl. Bot. Reg.* sub t. 1663; *Kunth, Enum.* iv. 254; *Wood, Proc. Acad. Phil.* 1868, 167.—*Liliorhiza lanceolata*, *Kellog, Proc. Acad. Calif.* ii. 46, t. 1. Bulbus 6-9 lin. crassus squamis bulbiformibus pluribus cinctus. Caulis  $\frac{1}{2}$ -1-pedalis 1-6-florus, foliis 9-15 prope basin aggregatis infimis sæpe oppositis vel ternis oblanceolatis carnosus 2-4 poll. longis 3-9 lin. latis. Flores cernui subsecundi, pedicellis  $\frac{1}{2}$ -2 poll. longis, foliis reductis linearibus bracteati. Perianthium infundibuliformi-campanulatum 9-12 lin. longum, segmentis oblanceolato-oblongis albidis viridi-venosis haud tessellatis medio 3-4 lin. latis apice leviter cucullatis, dimidio inferiore foveola carinali obscura viridi præditis. Stamina perianthio duplo breviora, antheris apiculatis filamentis duplo brevioribus. Ovarium 3 lin. longum; stylus ovario subæquilongus, stigmata paulo superans. Capsula obovoidea 8-9 lin. longa obtuse angulata, collo brevi turbinato, apice umbilicata. *California et Nevada*, Douglas! Coulter, 739! Hartweg, 2006! &c.

50. *F. BIFLORA*, *Lindl. Bot. Reg.* sub t. 1663; *Kunth, Enum.* iv. 254. Bulbus parvus squamis bulbiformibus cinctus. Caulis 6-9-pollicaris apice 1-2-cephalus, foliis 4-8 plerisque infra medium positis, infimis sæpissime oppositis lanceolatis vel oblongo-lanceolatis obtusiusculis 2-4 poll. longis medio 6-9 lin. latis, reliquis sparsis vel 2 inferioribus raro oppositis lanceolatis acutis. Pedicelli cernui foliis lanceolatis bracteati. Perianthium infundibuliformi-campanulatum 12-15 lin. longum, livide vinoso-purpureum vix tessellatum viridulo suffusum, segmentis oblanceolato-oblongis medio 3 lin. latis unguibus obscure carinali-foveolatis. Stamina perianthio dimidium breviora, antheris apiculatis  $1\frac{1}{2}$ -2 lin. longis filamentis 2-3plo brevioribus. Ovarium 3-4 lin. longum; stylus  $1\frac{1}{2}$  lin. longus stigmatibus falcatis æquilongus. Capsula late obovoidea 6-9 lin. longa obtuse angulata. *California*, Douglas! Coulter, 737! 738! Bigelow! &c.

51. *F. KAMTSCHATCENSIS*, *Gawl. Bot. Mag.* sub t. 1216; *Hook. Flor. Bor. Am.* ii. 181, t. 193 A; *Kunth, Enum.* iv. 254; *Regel, Gartenf.* t. 173.—*Lilium camtschatcense*, *Linn. Sp.* 435; *Lambert, Linn. Trans.* x. t. 11.—*L.* affine, *Schult. Syst.* vii. 400 (*excl. syn.*).—*L. quadrifoliatum*, *E. Meyer, Rel. Hænk.* ii. 126.—*Amblirion camtschat-*

*cense*, *Sweet*, *Hort. Brit.* 538.—*Sarana edulis*, *Fisch. MSS.* Bulbus parvus globosus squamis crassis bulbilliformibus pluribus cinctus. Caulis  $\frac{1}{2}$ – $1\frac{1}{2}$ –pedalis, apice 1–3–cephalus, foliis 10–15 supra medium impositis, inferioribus in verticillos 1–3 3–6–foliatis dispositis lanceolatis 2–4 poll. longis medio 6–12 lin. latis, superioribus minoribus sparsis. Pedicelli cernui 6–12 lin. longi foliis linearibus bracteati. Perianthium campanulatum 12–15 lin. longum livide vinoso-purpureum haud tessellatum segmentis oblongo-oblanco-latis obtusis 3–4 lin. latis unguibus carinato-foveolatis nigro-punctatis leviter papilloso-lamellatis. Stamina perianthio dimidio breviora, antheris flavis  $1\frac{1}{2}$  lin. longis filamentis triplo brevioribus. Ovarium 3 lin. longum; stylus brevissimus, stigmatibus late falcatis duplo brevior. Capsula obovoidea 9–12 lin. longa obtuse angulata collo turbinato. *Siberia orientalis, Kamtschatka, Japonia, America borealis occidentalis e Sitka ad Californiam.*

Subgenus X. PETILIUM (*Linn.*). Bulbus magnus perennis squamosus. Flores multi umbellati. Stylus apice stigmatoso tricuspidatus. Genitalia elongata. Capsula angulis 6 acutis alatis. Nectarium crassum subrotundum margaritaceum, humore lim-pido copioso exudans.

52. F. IMPERIALIS, *Linn. Sp.* 435; *Mill. Dict.* No. 8; *Lam. Ill.* t. 245; *Bot. Mag.* t. 194 et 1215; *Red. Lil.* t. 131.—*Imperialis canosa*, *Mæneh. Meth.* 395.—*Fritillaria corona-imperialis*, *Gærtn. Fruct.* i. 64, t. 17. fig. 1.—*Petilium imperiale*, *Jaume St.-Hil. Familles*, i. 120; *Kunth, Enum.* iv. 246. Bulbus magnus globosus squamosus flavescens perennis odore vulpino. Caulis erectus strictus 3–4–pedalis viridis vel rubello maculatus pede supremo et prope basin nudus. Folia plurima conferta lanceolata viridia ascendentia, superiora acuminata medio 6–12 lin. lata, suprema sæpe 8–10 verticillata, infima opposita breviora latiora obtusiora. Flores ad apicem caulis plurimi semper umbellati cernui, foliis 8–20 linearibus erectis bracteati. Perianthium inodorum, flavum vel lateritium 21–30 lin. longum, segmentis oblanco-lato-oblongis 9–15 lin. latis acutiusculis nullo modo tessellatis sed venis verticalibus pictis supra basin nectario crasso rotundato margaritaceo excavato foveolatis. Filamenta albida segmentis paulo breviora deorsum applanata dimidio inferiore valvata; antheræ luteæ 4–5 lin. longæ. Ovarium 5–6 lin. longum; stylus exsertus apice breviter tricuspidatus. Pedicelli fructiferi erecti. Capsula obovoidea 2 poll. longa, angulis 6 acutis alatis collo turbinato semipollicari. *Persia*, *Kotschy*, 326! *Aucher-Eloy*, 5380! *Loftus*! *Afghanistan*, *Griffith*, 5865! *Kashmiria*, 7000–9000 *pedes*, *Dr. Thomson*! De formis vide *Miller, Dict.* Floret prima omnium ad finem Martii.



## Species dubiæ.

53. *F. JAPONICA*, *Miquel, Ann. Mus. Lug. Bat.* iii. 158. "Caulis 5-pollicaris e bulbo piso vix majore basi pauco-squamoso nudus tenuis, apice foliis 4-5 approximatis lanceolatis utrinque acutis uniflorus. Pedicellus flori subæquilongus nutans. Perigonium  $\frac{1}{2}$  poll. longum dilatato-campanulatum, phyllis ovatis apice acutiusculis leviter recurvulis, extus pallide lilacinis? puncticulatis intus citrinis et sanguineopunctatis. Antheræ flavæ elliptico-oblongæ. Stigma tripartitum lobis linearibus. Ad iconem libri Japonici determinavi" (*Miquel, loc. cit.*) *Japonia*.
54. *F. MINUTA*, *Boiss. & Noé, Diagn. ser. 2, iv.* 103. Caulis bipollicaris monocephalus, foliis 4, infimis sparsis lanceolatis acutiusculis 18 lin. longis 4 lin. latis, supremis oppositis anguste linearibus. Perianthium campanulatum 6 lin. longum segmentis oblanceolatis 2 lin. latis. Stamina perianthio paulo breviora, antheris oblongis luteis obtusis filamentis papillois duplo brevioribus. Stylus ignotus. *In subalpinis Kurdistania cum F. kurdica, Noé.*
55. *F. SIBTHORPIANA*, *Baker.*—*Tulipa Sibthorpiana, Smith, Flor. Græc.* iv. 25, t. 330; *Kunth, Enum.* iv. 225. Bulbus membranaceo-tunicatus depresso-globosus. Caulis semipedalis gracilis glaber monocephalus. Folia 2 prope medium caulis imposita remota ascendente glaucescentia glabra lanceolata, inferius 4-4 $\frac{1}{2}$  poll. longum, ad pollicem latum, supremum minus. Perianthium cernuum campanulatum flavum, vix unciam longum, segmentis oblanceolato-oblongis 3-4 lin. latis. Genitalia perianthio sub dimidium breviora, antheris apiculatis filamentis puberulis paulo brevioribus. Ovarium breve turbinato-triquetrum lutescens glabrum. Stylus ovario triplo longior clavatus ochroleucus undique pubescens, superne triqueter obtuse trilobus. *Asia minor prope Cressam, Sibthorp. Peloponnesus in monte humili saxoso prope Pilon, hodie Navarin, Hawkins. Non vidi.*

3. TULIPA, *Linn.*

*Gen.* no. 415; *Endl. Gen.* no. 109; *Kunth, Enum.* iv. 219; *Regel, Enumeratio specierum generis Tulipæ, 1873; Van Houtte, Flore des Serres, sub t. 1223.*—*Orithyia, D. Don in Sweet, Flow. Gard.* ser. ii. t. 336; *Endl. Gen.* no. 1092; *Kunth, Enum.* iv. 226.

*Perianthium* 6-partitum corollinum diutine campanulatum vel infundibuliformi-campanulatum, segmentis oblongis vel oblanceolato-oblongis vel obovato-oblongis caducis basi sæpe macu-

latis nunquam foveolatis nec tessellatis. *Stamina* 6 hypogyna subæqualia erecta, perianthio dimidium breviora, filamentis apice subulatis deorsum plus minus applanatis, antheris oblongis vel lineari-oblongis rectis basi profunde perforatis secus margines longitudinaliter dehiscentibus. *Ovarium* sessile, clavatum vel ampullaceum, triloculare, ovulis in loculo crebris horizontalibus; stylus sæpissime obsoletus, raro ovario æquilongus filiformis; stigmata 3 auriculata parva vel magna reflexa profunde canaliculata. *Capsula* oblonga vel obovoidea membranacea loculicide trivalvis, seminibus crebris discoideis; testa membranacea brunnea.—*Herbæ bulbosæ caulescentes foliis 2-4 carnosoherbaceis loratis vel lineari-lanceolatis sæpissime glaucescentibus, floribus erectis raro ante anthesin cernuis speciosis, sæpissime solitariis, florescentia vernali.*

Subgenus EUTULIPA. *Stylus obsoletus.*

ERIOBULBI. *Bulbi tunicæ intus dense lanatæ. Pedunculus glaber lævis. Filamenta basi glabra.*

- |  |                         |
|--|-------------------------|
| Segmenta perianthii omnia acuta .....                          | 1. <i>oculus-solis.</i> |
|  | 2. <i>sogdiana.</i>     |
| Segmenta exteriora acuta, interiora apice rotundata cuspidata. |                         |
| Folia inferiora lorato-lanceolata .....                        | 3. <i>chrysantha.</i>   |
|  | 4. <i>montana.</i>      |
|  | 5. <i>maleolens.</i>    |
|  | 6. <i>præcox.</i>       |
| Folia omnia anguste lineari-lorata .....                       | 7. <i>Clusiana.</i>     |
| Segmenta omnia obtusiuscula .....                              | 8. <i>stellata.</i>     |
|  | 9. <i>Borszczowi.</i>   |

GESNERIANÆ. *Bulbi tunicæ intus glabræ vel leviter adpresse pilosæ. Pedunculus glaber lævis. Filamenta basi glabra.*

- |  |                         |
|--|-------------------------|
| Segmenta omnia acuminata .....                         | 10. <i>acuminata.</i>   |
|  | 11. <i>retroflexa.</i>  |
| Segmenta omnia acuta vel interiora cuspidata.          |                         |
| 12. <i>bithynica.</i>                                  | 13. <i>Didieri.</i>     |
| 14. <i>campsopectala.</i>                              | 15. <i>serotina.</i>    |
| Segmenta omnia apice rotundata cuspidata vel truncata. |                         |
| 16. <i>Boissieri.</i>                                  | 17. <i>Gesneriana.</i>  |
| 18. <i>fulgens.</i>                                    | 19. <i>platystigma.</i> |

SCABRISCAPÆ. *Bulbi tunicæ intus glabræ vel leviter adpresso-pilosæ. Pedunculus pubescens scabriusculus. Filamenta basi glabra.*

- |  |     |                       |
|--|-----|-----------------------|
| Segmenta omnia acuminata.....                                  | 20. | <i>undulatifolia.</i> |
|  |     | 21. <i>elegans.</i>   |
| Segmenta omnia acuta, vel interiora apice rotundata cuspidata. |     |                       |
| 22. <i>bœotica.</i>  | 23. | <i>strangulata.</i>   |
| 24. <i>suavcolens.</i>   | 25. | <i>altaica.</i>       |
| Segmenta omnia apice rotundata cuspidata.                      |     |                       |
| 26. <i>Eunanthiæ.</i>  | 27. | <i>pubescens.</i>     |
| 28. <i>maculata.</i>   | 29. | <i>Greigi.</i>        |

SAXATILES. *Perianthium utrinque puniceum. Filamenta basi barbata.*

- |                                    |     |                   |
|------------------------------------|-----|-------------------|
| Grandiflora segmentis obtusis..... | 30. | <i>saxatilis.</i> |
| Parviflora segmentis acutis .....  | 31. | <i>pulchella.</i> |

SILVESTRES. *Perianthium intus luteum vel albido-luteum, nunquam puniceum. Bulbi tunicæ sæpe apice pilosæ. Filamenta basi barbata.*

- |  |     |                             |
|--|-----|-----------------------------|
| Perianthium extus violaceo-tinctum ..... | 32. | <i>violacea.</i>            |
| Perianthium extus viridulo-tinctum.      |     |                             |
| Luteæ.....                               | 33. | <i>sylvestris.</i>          |
|  |     | 34. <i>fragrans.</i>        |
|  |     | 35. <i>Biebersteiniana.</i> |
| Pallidæ .....                            | 36. | <i>patens.</i>              |
|  |     | 37. <i>biflora.</i>         |
| Perianthium extus rubello tinctum.       |     |                             |
| Luteæ.....                               | 38. | <i>humilis.</i>             |
|  |     | 39. <i>microgyna.</i>       |
|  | 40. | <i>australis.</i>           |
|  | 41. | <i>crispatula.</i>          |
|  | 42. | <i>gallica.</i>             |
|  | 43. | <i>Orphanidea.</i>          |
| Pallidæ .....                            | 44. | <i>cretica.</i>             |
|  | 45. | <i>Lownei.</i>              |

Subgenus ORITHYIA. *Stylus ovario æquilongus.*

Bulbus glaber.

- |                                 |     |                      |
|---------------------------------|-----|----------------------|
| Perianthium intus luteum .....  | 46. | <i>uniflora.</i>     |
| Perianthium intus albidum ..... | 47. | <i>heterophylla.</i> |
| Bulbus lanosus .....            | 48. | <i>edulis.</i>       |

1. *T. OCLUSUS-SOLIS*, *St. Amans, Rec. Soc. Agric. Agen.* i. 75; *Red. Lil.* t. 219; *Sweet, Flow. Gard.* ser. ii. t. 102; *Kunth, Enum.* iv. 222.—*T. oculus-solis*, var. *typica*, *Regel, Enum.* 46.—*T. agenensis* *Red. Lil.* 60.—*T. acutiflora*, *Poir. Encyc.* viii. 134. Bulbus ovoideus 15–18 lin. crassus stoloniferus tunicis castaneis intus dense griseo-lanosis. Caulis glaber flexuosus subpedalis. Folia 3–4 infra medium caulis imposita viridia glabra ascendentia, inferiora lorato-lanceolata acuta 9–12 lin. longa, infra medium  $1\frac{1}{2}$ –2 poll. lata, superiora lanceolata. Perianthium inodorum erectum expansum infundibuliformi-campanulatum  $2\frac{1}{2}$ –3 poll. longum, segmentis oblongis omnibus acuminatis, facie splendide coccineis, supra basin macula oblanceolata nigro-purpurea flavo cincta 12–15 lin. longa notatis, exterioribus medio 9–12 lin. latis, interioribus angustioribus paulo brevioribus sæpe minus acuminatis. Stamina segmentis subtriplo breviora, antheris flavis 6–9 lin. longis, filamentis glabris atro-purpureis. Ovarium cylindricum 8–9 lin. longum, stigmatibus 2 lin. latis. *Gallia meridionalis, Helvetia, Italia, post præcocem 9–10 dies florens.*
- Var. *LORTETII*, *Baker.*—*T. Lortetii*, *Jord. Nouv. Tulip.* 3; *Ard. Fl. Alp. Marit.* 374. Minor, caule 6–8-pollicari, foliis crebrioribus, perianthii segmentis 18–20-lin., e medio 5–6 lin. latis, utrinque valde angustatis, macula basali oblanceolata nigricanti 6–8 lin. longa, staminibus perianthio subduplo brevioribus. *In cultis prope Massiliam, Lortet!*
- Var. *LYCICA*, *Baker.* Caulis 6–8-pollicaris, foliis confertis, infimis 5–6 poll. longis. Perianthium 18–20 lin. longum, segmentis omnibus acutis 5–6 lin. latis, interioribus oblanceolato-oblongis apice subdeltoideis, macula basali nigricante 5–6 lin. longa, antheris filamenta atro-purpurea duplo superantibus. *Lycia prope Arsam, Prof. E. Forbes!*
- Var. *ALEPPICA*, *Baker.*—*Tulipa aleppica*, *Boiss. & Hauss. Ezsic.; Regel, Enum.* 50. Caulis subpedalis, foliis haud approximatis. Perianthium  $2\frac{1}{2}$ –3 poll. longum, segmentis exterioribus oblongo-oblanceolatis acuminatis infra medium 9–10 lin. latis macula basali obscuriore vix flavo cincta, interioribus semipollicem brevioribus oblongo-spathulatis medio 8–9 lin. latis obtusiusculis. *In agris prope Aleppo, Haussknecht! Palæstina ad declivitates montium Hermon et Jebel Altarus, Hayne.*
2. *T. SOGDIANA*, *Bunge, Rel. Lehm.* 338; *Walp. Ann.* vi. 102; *Regel, Enum.* 52. Bulbus parvus ovoideus, tunicis intus dense griseo-lanosis. Caulis gracillimus flexuosus glaber 3–4-pollicaris, foliis duobus segregatis infra medium impositis recurvatis lanceolatis glabris acutis, majore 2–3 poll. longo, haud undulatis. Perianthium erectum flavum 7–8 lin. longum segmentis oblongis acutis medio 3–4 lin. latis,

unguibus spathulatis obscure ciliolatis. Stamina perianthio dimidium breviora, antheris  $1\frac{1}{2}$  lin. longis filamentis applanatis glabris duplo brevioribus. Ovarium 3 lin. longum ampullæforme, collo angustato, stigmatibus parvis. *In deserto Asiatico centrali arido inter Bucharam et Hermine, floret Martio, Lehmann!*

3. *T. CHRYSANTHA*, Boiss. in Kotschy, *Fl. Pers. Bor. Exsic. anno 1846*, No. 78.—*T. Lehmanniana*, Merckl. in Bunge, *Rel. Lehm.* 337; *Walp. Ann.* vi. 102.—*T. undulata*, Jacquemont, *MSS.* Bulbus ovoideus vel globosus 9–12 lin. crassus, tunicis firmis brunneis intus dense flavido-lanosis. Caulis floriferus glaber 3–4-pollicaris, foliis 3–4 glabris glaucis valde undulatis margine cartilagineo, infimis recurvatis vel ascendentibus lanceolatis 4–6 poll. longis 6–9 lin. latis, superioribus confertis angustioribus. Perianthium flavum vel aurantiacum vel extus rubello tinctum 12–15 lin. longum, segmentis oblongis medio 5–6 lin. latis acutis vel leviter obovatis subobtusis, unguibus obscure brunneo maculatis. Stamina perianthio bis triente breviora, antheris 3–5 lin. longis filamenta superantibus. Ovarium ampullæforme 4–5 lin. longum, collo angustato, stigmatibus parvis. *In deserto Asiatico centrali prope Bucharam, Lehmann! Persia borealis, Kotschy! Afghanistan, Griffith, 5788! 5790! Per totam Beloochistaniam superiorem ad pedes 5000–6000 ineunte Aprilis florens, ad pedes 9000 ineunte Maio, Stocks, 860! Pentapotamia occidentalis, Jacquemont, 150! Fleming! “Bulbi inter delicias estimantur, me iudice castanearum æmuli. Iis avide vescuntur, tempore vernali, pueri et puellæ.”—Stocks.*

4. *T. MONTANA*, Lindl. *Bot. Reg.* t. 1106; *Schult. fl. Syst.* vii. 1684; *Kunth, Enum.* iv. 223; *Regel, Enum.* 54.—*T. armeniaca*, Parkins. *Parad.* 53, t. 8. Bulbus ovoideus 12–15 lin. crassus, tunicis brunneis membranaceis intus dense griseo-lanosis. Caulis 4–8-pollicaris, foliis 4 ab flore remotis glaucis glabris falcatis vel ascendentibus margine valde undulatis, infimis oblongo-lanceolatis 4–6 poll. longis infra medium 8–12 lin. latis, superioribus lanceolatis. Perianthium  $1\frac{1}{2}$ –2 poll. longum campanulatum intus splendide puniceum, extus pallidius, segmentis oblongis acutis medio 8–12 lin. latis macula basali elongata vel brevi deltoidea nigricante flavo cincta notatis, interioribus paulo brevioribus magis obovatis cuspidatis vel obtusis. Stamina segmentis subtriplo breviora, antheris 4–6 lin. longis, filamenta atropurea superantibus. Ovarium cylindricum 6–7 lin. longum, stigmatibus 2 lin. latis. *Armenia, 4000–5000 pedes, Huet du Pavillon! Zohrab! Calvert! ad ripas Euphratis, Chesney, 94! Persia meridionalis, Aucher-Eloy, 5374! Kotschy, 114! Haussknecht! Arabia petræa, Laborde! Kurdistan, Olgum! Garden! Afghanistan, Griffith, 5789!*

Var. *T. JULIA*, K. Koch, *Linn.* xxii. 23; *Led. Fl. Ross.* iv. 134; *Regel,*

- Enum.* 48. Humilior, caule 2-3-pollicari, perianthio pollicari segmentis omnibus more *Gesnerianæ* oblanceolato-oblongis obtusis vel leviter cuspidatis. In ditone *Caucasica*, K. Koch, Szovits! *Turkestanica*, Fedschenko teste Regel.
5. *T. MALEOLENS*, *Reboul, Tulip. Spec. App.* 1; *Schult. fl. Syst.* vii. 376; *Lindl. Bot. Reg.* 1839, t. 66; *Kunth, Enum.* iv. 222; *Reich. Ic. Germ.* t. 450.—*T. oculus-solis*, var. *maleolens*, *Regel, Enum.* 46, *excl. syn.* Bulbus ovoideus 12-15 lin. crassus stoloniferus tunicis intus dense griseo-lanosis. Caulis glaber subpedalis, foliis 3-4 infra medium impositis glaucescentibus undulatis, infimis lorato-lanceolatis 5-6 poll. longis 1-1½ poll. latis, superioribus lanceolatis. Perianthium campanulatum 1½-2 poll. longum, "odore injucundo sed levi," intus splendide rubro-sanguineum, extus pallidius, segmentis macula deltoidea atro-purpurea flavo cincta unguem totum occupante notatis, exterioribus oblongis acutis medio 9-12 lin. latis, interioribus paulo brevioribus apice latioribus cuspidatis. Stamina perianthio sub duas partes breviora, antheris 4½-5 lin. longis, filamentis atro-purpureis glabris æquilongis. Ovarium 6 lin. longum, stigmatibus 2-2½ lin. latis. *Italia, in ducatu Lucensi et agro Florentino, post præcoecem florens*, *Reboul! Parlatore!* Var. *VARIEGATA*, *Sweet, Brit. Flow. Garden*, ser. ii. t. 153, est forma magna hortensis floribus rubro-purpureis flavis cupreis et pallide glaucis variegatis.
6. *T. PRÆCOX*, *Tenore, Flor. Neap.* i. 170, fasc. i. t. 32; *Schult. fl. Syst.* vii. 378, 1683; *Kunth, Enum.* iv. 223; *Sweet, Flow. Gard.* t. 187; *Reich. Ic.* t. 986-7; *Jord. Fragm.* i. 39, t. 5. fig. 3, *non Cav.*—*T. Gesneriana*, *Bot. Reg.* t. 380, *non L.*—*T. oculus-solis*, *Bot. Reg.* t. 204, 1143, 1419; *Reich. Ic.* t. 985?—*T. bombycina* flore rubro, *Parkins. Parad.* 53, t. 1 (1629).—*T. oculus-solis*, var. *præcox*, *Regel, Enum.* 47. Bulbus ovoideus 15-18 lin. crassus stoloniferus, tunicis castaneis intus dense griseo-lanosis. Caulis glaber flexuosus teres 12-18-pollicaris. Folia 3-5 infra medium caulis imposita glauca vel subviridia glabra, inferiora lorato-lanceolata 9-15 poll. longa infra medium 2-3 poll. lata acuta margine undulata, superiora minora lanceolata. Perianthium inodorum erectum campanulatum 2-3 poll. longum, segmentis late imbricatis dorso valde convexis facie splendide coccinea supra basin macula ampla oblonga vel oblanceolata nigro-purpurea flavo cincta apice erosa 9-12 lin. longa notatis, exterioribus paulo longioribus ovato-oblongis acutis 12-15 lin. latis dorso pallidioribus apice puberulis, interioribus angustioribus oblongis paulo brevioribus apice obtusiusculis cuspidatis. Stamina perianthio ultra dimidium breviora antheris flavidis filamenta glabra atro-purpurea duplo excedentibus. Ovarium cylindricum 6-9 lin. longum, stigmatibus pubescentibus rubescentibus 2-2½ lin. latis. *Gallia meridionalis et*

- Italia, ad finem Martii florens. In cultis insulæ Chios, Von Heldreich! In pomariis Aleppo, Haussknecht! Palestina, ad Magdalam, Lowne, 400! (forma angustifolia). Persia, Sir. H. Willock.—T. PRÆCOX, Reboul, est forma segmentis angustioribus acutis foliis viridibus; T. RADDII, Reboul, segmentis angustioribus acutis foliis glaucis; T. FOXIANA, Reboul (et T. APULA, Gussone in *Ten. App.* v. 12; *Parl. Fl. Ital.* ii. 389; T. Strangwaysiana, Reboul in *herb. DC.*! T. oculusolis, var. Strangwaysii, Regel, *Enum.* 47), segmentis latioribus, exterioribus 15–18 lin. latis, interioribus brevioribus obovatis obtusiusculis.*
7. T. CLUSIANA, *Vent. in Red. Lil.* t. 37 (1802); *Bot. Mag.* t. 1390; *Sibth. & Sm. Flor. Græc.* t. 329; *Kunth, Enum.* iv. 223; *Moggridge, Cont. Ment.* t. 24.—T. præcox, *Car. Praelect.* 448 (1802), non *Ten.*—T. rubro-alba, *Brotero, Fl. Lus.* i. 520 (1804).—T. persica præcox, *Clus. Cur. Post.* 18.—T. persica, *Parkins. Parad.* 53, t. 6. Bulbus ovoideus 9–12 lin. crassus, stoloniferus, tunicis intus dense brunneo-sericeo-pilosis. Caulis gracilis flexuosus glaber 12–18-pollicaris. Folia 4–5 distantia glauco-viridia glabra, omnia anguste lineari-lorata haud undulata acuminata, inferiora 6–12 poll. longa 6–9 lin. lata, superiora minora angustiora. Pedunculus 3–6-pollicaris. Perianthium erectum infundibuliformi-campanulatum 12–18 lin. longum, intus albidum fundo cærulescente, extus rubro tinctum, segmentis exterioribus lanceolatis acutis basi spathulatis 4–6 lin. latis, interioribus paulo brevioribus obtusiusculis. Stamina perianthio sub duos trientes breviora, antheris purpurascensibus 3–4 lin. longis filamentis glabris æquilongis. Ovarium 5–6 lin. longum, stigmatibus parvis. *Gallia meridionalis et Lusitania ad Byzantium et Græciam.*
8. T. STELLATA, *Hook. Bot. Mag.* t. 2762; *Schult. fl. Syst.* vii. 1684; *Kunth, Enum.* iv. 223.—T. Clusiana, var. stellata, *Regel, Enum.* 54. Bulbus ovoideus 9–12 lin. crassus, tunicis intus dense albido-lanosis. Caulis glaber gracilis 1–1½-pedalis. Folia 4–6 infra medium caulis imposita glabra glaucescentia canaliculata haud undulata, omnia anguste lineari-lorata, inferiora 9–12 poll. longa 4–6 lin. lata. Pedunculus 6–9-pollicaris. Perianthium infundibuliformi-campanulatum 1½–2 poll. longum, intus albidum fundo flavum, extus rubello tinctum, segmentis conformibus oblanceolato-spathulatis obtusiusculis vel interdum acutis infra medium 5–6 lin. latis. Stamina perianthio bis triente breviora, antheris filamentis glabris subæquilongis. Ovarium ampullæforme 5–6 lin. longum stigmatibus parvis. *Regio temperata Himalayæ occidentalis, alt. 5000–8000 pedes, Lady Dalhousie! Strachey & Winterbottom! Dr. Thomson! &c. Persia australis, Kotschy, 99! Habitus omnino T. Clusianæ; differt floribus majoribus fundo flavis, segmentis omnibus oblanceolato-spathulatis obtusis.*

9. *T. BORSZCZOWI*, *Regel, Enum.* 48. Bulbus tunicis intus pilis tenuibus flexuosis fuscis sericeo-lanuginosis. Caulis glaber 8-16-pollicaris uniflorus. Folia 3-4 glauca glabra eximie undulata, marginibus cartilagineis, inferiora lorato-lanceolata, superiora angustiora, sæpissime recurvato-patentia. Perianthium campanulatum, rubrum vel luteum, segmentis omnibus obtusis vel leviter cuspidatis, basi macula atro-cærulea notatis. Filamenta sæpissime atro-cærulea antheris æquilinga. Stigma leviter trilobum. *In desertis Aralesibus*, Borszczow; *et in Turkestanian prope Tashient*, Fedschenko et Kuschakewicz. (Non vidi.)
10. *T. ACUMINATA*, *Vahl in Horn. Hort. Hafn.* i. 328 (1813).—*T. stenopetala*, *Mord. Del. Bon. Jard.* 1813, 269; *Lois. Herb. Amat.* t. 171.—*T. cornuta*, *DC. in Red. Lil.* t. 445; *Bot. Reg.* t. 127.—*T. turcica*, *Kunth, Enum.* iv. 221; *Regel, Enum.* 56, non *Roth*. Bulbus ovoideus 12-15 lin. crassus, tunicis castaneis intus glabris. Caulis 12-18-pollicaris flexuosus glaber. Folia sæpissime 3 infra medium caulis imposita glaucescentia glabra ascendentia, inferiora lorato-lanceolata 6-9 poll. longa margine undulata infra medium  $1\frac{1}{2}$ -2 poll. lata, superiora lanceolata acuminata. Pedunculus 6-9-pollicaris flexuosus glaber. Perianthium inodorum erectum 3-4 poll. longum saturate puniceum vel flavum vel album vel variegatum, segmentis conformibus lanceolatis longe caudato-acuminatis dimidio superiore valde undulatis ad apicem quarti inferioris 5-6 lin. latis. Stamina perianthio 5-6plo breviora, antheris flavis  $4\frac{1}{2}$ -5 lin. longis filamentis subæquilingis. Ovarium cylindricum 8-9 lin. longum, stigmatibus latitudine crassitiem ovarii duplo superantibus. *Stirps hortensis diu culta, per totum mensem Aprilis florens, verisimiliter ab T. bithynica orta.*—*T. MEDIA*, *Agardh, in Schult. fil. Syst.* vii. 379; *Kunth, Enum.* iv. 222, est stirps hortensis affinis floribus puniceis albo-variegatis segmentis apice glabris.
11. *T. RETROFLEXA*, *Hort.* Bulbus, statura et folia omnino *T. Gesnerianæ*. Pedunculus glaber flexuosus 6-9-pollicaris. Perianthium splendide luteum concolor campanulatum  $2\frac{1}{2}$ -3 poll. longum, segmentis oblongis medio 12-15 lin. latis acuminatis dimidio superiore divaricato-falcatis valde undulatis. Stamina segmentis triplo breviora, antheris luteis 6-9 lin. longis filamenta luteola superantibus. Ovarium cylindricum 1 poll. longum, stigmatibus magnis undulatis latitudine crassitiem ovarii duplo superantibus. *Forma hortensis ad initium Maii florens.* Verisimiliter inter *Gesnerianam* et *acuminatam* hybrida.
12. *T. BITHYNICA*, *Griseb. MSS.* Bulbus ovoideus 9-12 lin. crassus, tunicis sordide fuscis intus glabris. Caulis 3-6-pollicaris gracilis glaber. Folia 4-6 prope terram confertis glabris planis, infimis anguste



loratis 5-6 poll. longis medio 3-4 lin. latis ad apicem et basin angustatis. Perianthium inodorum, 9-15 lin. longum splendide rubrum, segmentis conformibus lanceolatis acutis medio 3-4 lin. latis. Stamina perianthio ultra dimidium breviora, antheris flavis 3-4 lin. longis filamentis nigrescentibus glabris æquilongis. Ovarium ampullæforme 5-6 lin. longum, stigmatibus minutis. *Montes Asiæ minoris (Bithynia, Cadmus, etc.)*, Grisebach! Boissier! Aucher-Eloy, 2178! Elwes! Ad nives deliquescentes Junio floret.

13. T. DIDIERI, *Jord. Fragm.* i. 36, t. 5. fig. A; *Icones*, 8, t. 17; non *Gren. & Godr.*—T. *Gesneriana*, *Bellardi App. Fl. Ped.* 226, non *Linn.* Bulbus ovoideus 12-15 lin. crassus, tunicis castaneis intus parce adpresse pilosis vel glabris. Caulis strictus glaber 1-1½-pedalis, foliis 3-4 ascendentibus glaucis glabris undulatis, infra medium impositis, inferiore lorato-lanceolato 6-8 poll. longo, infra medium 15-18 lin. lato, superioribus lanceolatis. Perianthium campanulatum inodorum 1½-2 poll. longum, segmentis omnibus conformibus oblongis acutis medio 9-12 lin. latis, facie splendide puniceis, basi macula lata cæruleo-nigricante luteolo cincta unguem totum occupante notatis. Stamina perianthio plus quam duplo breviora, antheris 5-6 lin. longis, filamentis atro-purpureis glabris æquilongis vel superantibus. Ovarium cylindricum 6-7 lin. longum, stigmatibus flavis profunde canaliculatis crassitie ovarii duplo latioribus. *Sabaudia, in agris ad St. Jean de Maurienne*, Huguenin! ad initium Maii florens (cf. Perrier in *Bull. Bot. Soc. France*, xiv. 95).—T. *FRANSONIANA*, *Parl. (Nuov. Gen.* 15; *Flor. Ital.* ii. 392), planta Florentina, ex descriptione non potui separare.

Var. T. MAURIANA, *Jord. Ic.* 9 (mauritiana ad calcem tabulæ 20). Folia latiora minus undulata vix glauca. Perianthium splendide coccineum, segmentis basi macula lata flava notatis unguem totum occupante, interioribus paulo brevioribus obtusiusculis. *Cum typo.*

Var. T. PLANIFOLIA, *Jord. Ic.* 9, t. 19. Caulis flexuosus. Folia angustiora viridia minora haud undulata. Perianthium saturate coccineum, segmentis ima basi nigro maculatis, interioribus apice rotundatis, macula basali flavido cincta, florescentia paulo seriore. *Cum typo.*

Var. T. BILLIETIANA, *Jord. Ic.* 8, t. 18. Folia undulata. Perianthium concolor saturate flavum, segmentis exterioribus acutis, interioribus apice rotundatis obtusiusculis. Stigmata majora. *Cum typo*; florescentia 8-10 dies serior. T. ACUTIFLORA, *DC. herb.*! est forma culta ad *T. Didieri* arcte affinis, ad initium Aprilis florens, pedunculo 5-8-pollicari, foliis supremis oblongo-lanceolatis 1-1½ poll. latis.

14. T. CAMPSOPETALA, *Delaunay, Bon. Jard.* 1813, 269; *Lois. Herb. Amat.* t. 172.—T. *Gesneriana*, var. ? campsopetala, *Kunth, Enum.* iv.

221. Bulbus ovoides 15-18 lin. crassus, tunicis castaneis intus glabris. Caulis 1-1½-pedalis glaber. Folia 3-4 infra medium caulis imposita glauca canaliculata glabra haud undulata, inferiora lorato-lanceolata 6-9 poll. longa infra medium 2-2½ poll. lata. Pedunculus strictus glaber 6-9-pollicaris. Perianthium campanulatum suaveolens 2-2½ poll. longum, versicolor, luteo et rubro variegatum, segmentis exterioribus oblongis acutis medio circiter pollicem latis, interioribus obovatis obtusis vel cuspidatis. Stamina perianthio bis triente breviora, antheris 6-7 lin. longis filamenta glabra superantibus. Ovarium cylindricum 9-12 lin. longum, stigmatibus latitudine crassitiem ovarii duplo superantibus. *Stirps hortensis ad initium Maii florens.*
15. T. SEROTINA, *Reboul, Select. Sp. Tulip.* 6; *Bert. Fl. Ital.* iv. 85; *Kunth, Enum.* iv. 221. Bulbus ovoideus, tunicis intus glabris. Caulis 1-1½-pedalis glaber monocephalus. Folia 3 infra medium caulis imposita ascendente canaliculata vix undulata, inferius lorato-lanceolata 6-8 poll. longum 1 poll. latum, superiora angustiora lanceolata. Pedunculus semipedalis gracilis glaber. Perianthium 21-24 lin. longum splendide puniceum, segmentis basi vix maculatis, exterioribus oblongo-spathulatis acutis medio 7-8 lin. latis, interioribus latioribus obovatis cuspidatis. Stamina perianthio bis triente breviora, antheris 5-6 lin. longis filamenta glabra superantibus. Ovarium clavatum 6-7 lin. longum, stigmatibus latitudine crassitiem ovarii duplo superantibus. *In agro florentino, ad finem Maii florens postrema omnium, Reboul! (Vidi in herb. DC.)*
16. T. BOISSIERI, *Regel, Enum.* 43.—T. pulchella, *Boiss. in Roth. Pl. Exsic. non Fenzl.* Bulbum non vidi. Caulis glaber gracilis pedalis vel ultra. Folia 3, inferiora anguste lineari-lorata plana glabra 12-15 poll. longa 3-4 lin. lata margine ciliolata. Pedunculus glaber semipedalis. Perianthium erectum 14-15 lin. longum splendide rubrum, segmentis conformibus obovato-oblongis supra medium 7-8 lin. latis obtusis vel cuspidatis basi cuneatis obscure nigro maculatis. Stamina perianthio ultra dimidium breviora, antheris flavis 3 lin. longis filamentis glabris æquilongis. Ovarium 5 lin. longum, collo angustato, stigmatibus parvis. *Palæstina, prope Ramleh, Dr. Roth!*
17. T. GESNERIANA, *L. Sp.* 438 (*ex parte*); *Willd. Sp.* ii. 97; *Bot. Mag.* t. 1135; *Bot. Reg.* xxiv. t. 46, non t. 380; *Kunth, Enum.* iv. 221, *ex parte*; *Led. Ross.* iv. 134; *Sweet, Floral Guide,* t. 4 &c. (*tabulæ formarum cultarum* 47); *Regel, Enum.* 51. Bulbus ovoideus 12-15 lin. crassus, tunicis castaneis intus glabris vel leviter pilosis, bulbillis novis sessilibus. Caulis strictus glaber ½-pedalis, foliis 3-4 glaucis glabris ascendentibus infra medium impositis, inferioribus lorato-lanceolatis 5-6 poll. longis infra medium 12-18 lin. latis, sup-

rioribus lanceolatis. Perianthium erectum inodorum 12-24 lin. longum, campanulatum, segmentis splendide coccineis basi late purpureo-nigricante maculatis vel unguibus flavis vel luteis concoloribus rarius albidis, omnibus obovato-oblongis obtusis vel leviter cuspidatis supra medium 9-12 lin. latis raro angustioribus, exterioribus acutiusculis. Stamina perianthio subtriplo breviora, antheris 4-6 lin. longis filamenta glabra applanata atro-purpurea vel flava paulo vel triente superantibus. Ovarium cylindricum 5-6 lin. longum, stigmatibus magnis profundis flavis. *Rossia europæa centralis et meridionalis ab Tauria ad montes Altai et Songariam, Kurdistan, Garden! Armenia, Zohrab!*—T. ARMENA, Boiss. *Diagn.* ser. 2, iv. 99; Regel, *Enum.* 53, ab montibus Armeniæ alt. 6000-7000 pedes, *Huet du Pavillon!* non potui segregare.—T. SCHRENKI, Regel, *Enum.* 521, e Songaria et Turkestaniam, est verisimiliter forma sylvestris floribus 12-15 lin. longis infundibuliformi-campanulatis. Plantam dictam sylvestrem Florentinam (T. SPATHULATA, Bert. *Ital.* iv. 85.—T. Gesneriana, Rebul, *Sp.* 6; *Parl. Fl. Ital.* ii. 396; *Strangways in Bot. Reg.* xxiv. t. 46) non potui distinguere. Plantam banaticam ad *Gesnerianam* refertam non vidi; helvetica (*Vallesia inter segetes ad Sion, Muret! Boissier!*) sub nomine *T. Didieri* vel *T. oculi-solis* sæpe divulgata est GESNERIANA vel forma arcte affinis. Habemus *oculum-solis* veram ex eodem loco, a Thomasio lectam. Fons varietatum plurimarum serotinarum hortorum; sed characteres data omnino ad plantam vere sylvestrem pertinent.

18. T. FULGENS, *Hort.* Bulbus; statura et folia omnino *T. Gesnerianæ*. Pedunculus glaber 8-9-pollicaris. Perianthium campanulatum, splendide coccineum, fundo flavum, 2-2½ poll. longum, segmentis conformibus oblongis medio 10-12 lin. latis, basi cuneatis, apice rotundatis distincte cuspidatis. Stamina perianthio bis triente breviora, antheris flavis 5-6 lin. longis filamenta paulo superantibus. Ovarium cylindricum 8-9 lin. longum, stigmatibus latitudine crassitiem ovarii haud duplo superantibus. *Forma hortensis ad initium Maii florens, verisimiliter inter Gesnerianam et suaveolentem hybrida.*
19. T. PLATYSTIGMA, *Jord. Billot, Annot.* 32; *Icones* 8, t. 16.—T. Didieri, *Gren. Flor. Franc.* iii. 177, non *Jord.* Bulbus ovoideus pollicem crassus, tunicis castaneis intus parce pilosis. Caulis flexuosus glaber 1-1½-pedalis, foliis 3-4 infra medium impositis glaucescentibus facie glabris ciliolatis valde undulatis, inferiore lorato-lanceolato 6-8 poll. longo medio 1½-2 poll. lato, superioribus lanceolatis. Perianthium campanulatum 2-2½ poll. longum, lilacino-roseum odore violaceo, segmentis oblongis basi cuneatis medio 12-13 lin. latis apice falcatis obtusis vel cuspidatis, unguibus macula parva cærulescente oculo lutescente notatis. Stamina perianthio supra

dimidium breviora, antheris violaceis filamenta glabra superantibus. Ovarium cylindricum, stigmatibus magnis profundis undulatis latitudine crassitiem ovarii duplo superantibus. *In Alpibus Gallie austro-orientalis prope Guillestre, Roux.*

20. *T. UNDULATIFOLIA*, Boiss. *Diagn.* v. 57. Bulbus ignotus. Caulis vix semipedalis glaucescens pubescens. Folia inferiora lanceolata semipedalia arcuato-recurvata longe acuminata margine undulata deorsum pollicem lata, facie brevissime hirta, suprema multo minora. Perianthium erectum  $1\frac{1}{2}$ -2 poll. longum, splendide rubrum, segmentis ovatis longe acuminatis apice hirtulis exterioribus paulo latioribus, interioribus paulo brevius abruptiusque acuminatis, basi macula nigra late flavo cincta notatis. Filamenta glabra antheris duplo breviora. *In herbosis pinguibus ad pedem rupium in summo monte Tartali, supra Smyrnam, in Maio florens, Boissier. (Non vidi.)*
21. *T. ELEGANS*, Hort. Bulbus ovoideus 12-15 lin. crassus, tunicis castaneis, intus subglabris. Caulis 1- $1\frac{1}{2}$ -pedalis leviter pubescens, foliis 3-4 infra medium impositis glaucis facie leviter ciliatis, infimis lorato-lanceolatis 8-10 poll. longis infra medium 2 poll. latis. Pedunculus flexuosus 6-9-pollicaris leviter griseo-pubescens. Perianthium 3- $3\frac{1}{2}$  poll. longum, splendide coccineum fundo flavum, segmentis omnibus caudatis, exterioribus lanceolatis ad apicem tertii inferioris pollicem latis, interioribus medio 13-14 lin. latis utrinque attenuatis. Stamina perianthio ultra duos trientes breviora, antheris violaceis 6-7 lin. longis filamenta glabra superantibus. Ovarium cylindricum 8-10 lin. longum, stigmatibus flavis latitudine crassitiem ovarii sesqui superantibus. *Stirps hortensis ad finem Aprilis florens, verisimiliter inter acuminatam et suaveolentem hybrida.*—*T. ODORATISSIMA*, Vis. Ort. Bot. Pad. 149; Walp. Ann. i. 849, est verisimiliter forma affinis ad suaveolentem magis accedens.
22. *T. BÆOTICA*, Boiss. & Held. *Diagn.* ser. 2, iv. 99; Regel, Enum. 50.—*T. strangulata et oculus-solis, Held. Exsic. olim.* Bulbus ovoideus 1 poll. crassus, tunicis castaneis, intus glabris. Caulis 6-9-pollicaris flexuosus pubescenti-scabriusculus. Folia 3-4 infra medium caulis imposita glabra margine valde undulata, inferiora lorato-lanceolata 5-6 poll. longa infra medium 12-15 lin. lata, superiora lanceolata. Pedunculus 2-3-pollicaris, griseo-pubescens. Perianthium campanulatum saturate rubrum  $1\frac{1}{2}$ -2 poll. longum, segmentis conformibus oblongis acutis vel acuminatis medio 6-8 lin. latis basi macula angusta elongata nigricante flavo cincta notatis. Stamina perianthio sub duos trientes breviora, antheris luteis 5-6 lin. longis filamenta glabra paulo superantibus. Ovarium 6-7 lin. longum, stigmatibus latitudine crassitiem ovarii sesqui superantibus. *Bæotia et*

*Eubœa ad finem Martii florens*, Von Heldreich! Inter *oculum-solis* et *strangulatam* medium tenens; petala et macula prioris; bulbosus et scapus posterioris.

23. *T. STRANGULATA*, *Reboul, Spec. Tulip.* 6; *Schult. fil. Syst.* vii. 375, 1682; *Kunth, Enum.* iv. 221; *Parl. Fl. Ital.* ii. 399.—*T. scabriscapa*, var. *strangulata*, *Fox-Strangways, Bot. Reg.* t. 1990, fig. 3; *Bert. Fl. Ital.* iv. 86. Bulbus ovoideus stoloniferus 12–15 lin. crassus, tunicis castaneis intus glabris. Caulis subpedalis teres pubescens scabriusculus. Folia 3–5 infra medium caulis imposita ascendencia glauca undulata obscure ciliolata facie glabra, inferiora lorato-lanceolata 6–8 poll. longa infra medium  $1\frac{1}{2}$ –2 poll. lata, superiora minora lanceolata. Pedunculus 5–6-pollicaris. Perianthium erectum odore levi mellifero campanulatum  $1\frac{3}{4}$ –2 vel in hortis 3 poll. longum splendide coccineum, segmentis apice flore expanso falcatis, exterioribus oblongis acutis medio 9–12 lin. latis, interioribus magis obovatis apice rotundatis cuspidatis, omnibus basi macula lata brevi cæruleo-nigricante interdum flavo marginata notatis. Stamina perianthio triplo breviora, antheris 6–7 lin. longis filamenta glabra superantibus. Ovarium cylindricum 6–8 lin. longum, stigmatibus latitudine crassitiem ovarii sesqui superantibus. *In agro Florentino ad finem Aprilis et per Maiam florens*.—*T. NEGLECTA*, *Reboul, Select. Spec.* 7 (*T. scabriscapa*, var. *Hawardeniana*, *Bert. Ital.* iv. 86.—*T. scabriscapa*, var. *primulina*, *Fox-Strangways, Bot. Reg.* t. 1990, fig. 4) est forma floribus flavis concoloribus; et *T. BONAROTIANA*, *Reboul, Nonnul. Spec. Tulip.* 7 (*T. scabriscapa*, var. *Buonorottiana*, *Fox-Strangways, Bot. Reg.* t. 1990, fig. 2) et *T. VARIOPICTA*, *Reboul, Select. Sp. Tulip.* 7; *Parl. Fl. Ital.* ii. 399 (var. *Rebouliana*, *Bert. Fl. Ital.* iv. 87; var. *mixta*, *Fox-Strangways, Bot. Reg.* t. 1990, fig. 1) sunt formæ floribus rubro-luteo variegatis.

24. *T. SUAVEOLENS*, *Roth, Cat.* i. 45; *Willd. Sp.* ii. 97; *Bot. Mag.* t. 839; *Red. Lil.* t. 111; *Herb. Amat.* t. 98; *Kunth, Enum.* iv. 220; *Flore des Serres*, t. 1223.—*T. dubia pumilio*, *Clus. Hist.* 148, cum icone.—*T. præcox*, *Parkins, Parad.* 46 (*descrip.* 49, tab. 4 *varietatum*). Bulbus ovoideus 12–18 lin. crassus, tunicis castaneis intus glabris vel leviter adpresse pilosis, bulbis novellis sessilibus. Caulis strictus pubescens 3–6-pollicaris. Folia 3–4 prope basin caulis conferta glauca secus faciem griseo-pubescentia, inferiora lorato-lanceolata 6 poll. longa infra medium 1– $1\frac{1}{2}$  poll. lata, superiora lanceolata multo minora. Pedunculus 2–3-pollicaris conspicue griseo-pubescentis. Perianthium erectum suaveolens  $1\frac{1}{2}$ – $2\frac{1}{2}$  poll. longum, splendide coccineum vel flavum vel variegatum, segmentis conformibus oblongis acutis medio 6–9 lin. latis utrinque angustatis. Stamina perianthio triplo breviora, antheris luteis 4–6 lin. longis filamenta glabra superantibus. Ovarium 6–7 lin. longum cylindricum, stigmatibus latitudine crassitiem

ovarii sesqui superantibus. *Ad ripas Maris Caspici cum T. Gesneriana, Pallas!* In ditione *Tanaica*, Henning; *Tauria*, Steven. In hortis diutissime culta sub nomine "Duc Van Thol;" in Anglia per mensem totum Martii et initium Aprilis florens.—T. HORTULANORUM, *Wender, in Otto & Dietr. Gartenzeit.* vi. 71; *Walp. Ann.* i. 849, ex descriptione, non potui segregare. Cum *T. strangulata* jungit cl. Regel.

25. *T. ALTAICA, Pallas, Spreng. Syst. Veg.* ii. 63; *Schult. fl. Syst.* vii. 385; *Led. Ic.* t. 134; *Flor. Ross.* iv. 135; *Kunth, Enum.* iv. 226; *Regel, Enum.* 56. Bulbus ovoideus 9–12 lin. crassus, tunicis brunneis intus glabris. Caulis 6–9-pollicaris flexuosus pubescens. Folia 2–3 infra medium caulis imposita undulata glauca membranaceo-marginata facie pubescentia, inferiora lorato-lanceolata 5–6 poll. longa infra medium 9–12 lin. lata, superiora angustiora. Pedunculus 2–3-pollaricaris. Perianthium erectum infundibuliformi-campanulatum 15–18 lin. longum luteum immaculatum, segmentis oblongis vel oblanceolato-oblongis conformibus acutis vel acutiusculis 4–6 lin. latis dorso viridulo vel raro rubello tinctis. Stamina perianthio subduplo breviora, antheris luteis 3–5 lin. longis filamenta glabra applanata superantibus vel brevioribus. Ovarium 5–6 lin. longum, collo angustato, stigmatibus parvis longitudine crassitiem ovarii haud superantibus. *Siberia centralis meridionalis ad montes Altai, alt. 1000–6000 pedes, &c. Ledebour! Gebler! Semenow! &c., Turkestan, Korolkow.*

26. *T. EUNANTHIE, Orphan. in Boiss. Diagn.* ser. 2, iv. 100; *Regel, Enum.* p. 50. Bulbus mediocris, tunicis fuscis glabris. Caulis pubescenti-scabriusculus. Folia 3 prope medium caulis imposita undulata margine scabrida patenti-recurvata, inferiora lorato-lanceolata, suprema angustiora acuminata. Perianthium rubrum, segmentis obovatis basi attenuatis apice breviter cuspidatis macula basilari obovata nigricante flavido cincta notatis. Antheræ filamenta glabra paulo superantes. Stigma crassitiem ovarii triplo superans, *Laconia in regione media montis Malevo, Orphanides.* (Non vidi.)

27. *T. PUBESCENS, Willd. Enum. Suppl.* 17; *Sweet, Flow. Gard.* t. 78.—*T. suaveolens*  $\beta$ . *pubescens, Kunth, Enum.* iv. 220.—*T. suaveolens*  $\beta$ . *latifolia, Bot. Mag.* t. 2388. Bulbus ovoideus 12–15 lin. crassus, tunicis intus glabris vel obscure adpresse pilosis. Caulis teres strictus glaucus leviter pubescens 1–1½-pedalis. Folia 3–4 infra medium scapi imposita glauca ascendunt glabriuscula, inferiora lorato-lanceolata 6–9 poll. longa infra medium 1½–2 poll. lata. Pedunculus 6–9-pollicaris leviter griseo-pubescente scabriusculus. Perianthium campanulatum leviter suaveolens 2–2½ poll. longum, rubrum, luteum, album vel versicolor, segmentis exterioribus oblongis acutis vel cuspidatis medio 12–15 lin. latis, interioribus obovatis apice rotundatis

leviter cuspidatis. Stamina perianthio subtriplo breviora, antheris 5-6 lin. longis filamenta glabra superantibus. Ovarium cylindricum 8-9 lin. longum, stigmatibus latitudine crassitiem ovarii duplo superantibus. *Stirps hortensis longe et late cognita ad initium Aprilis et per totum mensem florens, verisimiliter inter Gesnerianam et suaveolentem hybrida, fons formarum plurimarum elatiorum præcocium sub nominibus Pottebakker, Claramond, Bride of Haarlem, Tournesol, etc., cultarum.*

- 28 T. MACULATA, *Hort.* Bulbus, caulis et folia *T. pubescentis*. Perianthium campanulatum, 2-2½ poll. longum, segmentis conformibus obovatis cuspidatis supra medium pollicem et ultra latis, splendide coccineis unguibus cæruleo-nigricantibus zona transversali luteo marginatis. Stamina perianthio triplo breviora, antheris purpureis filamenta glabra superantibus. Stigmata parva *T. suaveolentis*. *Stirps hortensis ad finem Maii florens, fortasse hybrida altera inter Gesnerianam et suaveolentem, petalis et floratione seriore prioris, stigmatibus parvis et pedunculo puberulo posterioris.*
29. T. GREIGI, *Regel, Enum.* 49. Bulbus tunicis apice intus strigosus. Caulis 2-8-pollicaris puberulus uniflorus. Folia 3-4 undulata eximie cartilagineo marginata, glabra vel margine ciliolata vel superiora facie minute puberula, caulem sæpissime superantia, in planta viva maculis oblongis fuscis notata, inferiora ovato-lanceolata, superiora angustiora. Pedunculus pubescenti-scabriusculus. Perianthium aperte campanulatum, segmentis obovato-cuneatis 1½-2 poll. longis obtusis cuspidatis, purpureis vel rubris basi macula oblonga nigrescente flavo cineta notatis vel luteis basi macula nigrescente sublineari notatis. Filamenta antheris subæquilonga. Stigma leviter trilobum. *Turkestan, Sewerzow, Fedschenko, &c.*
30. T. SAXATILIS, *Sieb. in Pl. Cret. Exsic. ex parte; Reich. Ic. Crit.* t. 396; *Schult. fil. Syst. Veg.* vii. 385; *Kunth, Enum.* iv. 226; *Regel, Enum.* 45. Bulbus non vidi. Caulis pedalis et ultra glaber 1-2-cephalus. Folia 3-4 infra medium caulis imposita, inferiora ad pedem longitudine attingentia lorato-lanceolata 15-18 lin. lata glabra margine undulata, superiora lanceolata acuminata. Perianthium 2 poll. longum saturate rubrum, segmentis omnibus obovatis spatulatis obtusis obscure cuspidatis, exterioribus 8-9, interioribus 9-12 lin. latis. Genitalia perianthio triplo breviora. Antheræ 3 lin. longæ filamentis appanatis basi dense barbatis duplo breviores. Ovarium 6-7 lin. longum collo angustato, stigmatibus parvis. *Creta ad cap. Maleca Sieber!*
31. T. PULCHELLA, *Fenzl, in Kotschy, Reise Cilic.* 379.—*T. sylvestris* var. *pulchella*, *Regel, Enum.* 43.—*T. alpina*, *J. Gay in Balansa, Pl. Orient. Exsic.* 1855. Bulbus ovoideus 6-9 lin. crassus, tunicis intus apice tenuiter pilosis. Caulis 2-3-pollicaris flexuosus glaber mono-

cephalus. Folia 2 raro 3 ad basin scapi conferta falcata patentia lorato-lanceolata glabra canaliculata, inferiora 3-4 poll. longa infra medium 6-8 lin. lata. Pedunculus 1-1½-pollicaris. Perianthium 10-12 lin. longum, infundibuliformi-campanulatum, utrinque rubrum, segmentis acutis oblanceolato-oblongis medio 3-4 lin. latis unguibus spathulatis haud maculatis conspicue ciliatis. Stamina perianthio duplo breviora, antheris oblongis 1½ lin. longis, filamentis supra basin dense ciliatis triplo brevioribus. Ovarium 4 lin. longum, ampullaceum, stigmatibus parvis. *Asia Minor; regio alpina montium Tauri, mense Julio florens*, Kotschy, 506! Balansa!

32. T. VIOLACEA, *Boiss. et Buhse, Reise Transcauc.* 211. Bulbus glabriusculus, tunicis fuscis. Caulis ad medium foliis 3 congestis linearibus glabris acutis canaliculatis 4-5 poll. longis inferne circiter semipollicem latis instructus. Perianthium 15-16 lin. longum, segmentis extus violaceis basi atro-cæruleis elliptico-lanceolatis acutis basi subunguiculatis apice ciliato-barbatis, exterioribus glabris, interioribus ad unguem dense ciliato-barbatis. Antheræ violaceæ, filamentis supra basin angustato-stipitatam dilatatis, basi dilatata ciliatis, dein superne sensim angustatis glabris. *Persia borealis*, Buhse. (Non vidi.)

33. T. SYLVESTRIS, *Linn. Sp.* 438; *Engl. Bot.* t. 63; *Flor. Dan.* t. 375; *Curt. Lond.* t. 19; *Red. Lil.* t. 165; *Bot. Mag.* t. 1202 (*excl. syn.*); *Schk. Handb.* t. 93; *Kunth, Enum.* iv. 224; *Reich. Germ.* t. 983, *non M. Bieb. nec Desf.* Bulbus ovoideus 6-9 lin. crassus stoloniferus, tunicis brunneis intus apice brunneo-sericeis. Caulis 9-15-pollicaris flexuosus glaber. Folia sæpissime 3 prope basin scapi imposita ascendente plana glaucescentia glabra canaliculata acuta, inferiora anguste lorata 6-12 poll. longa, medio 6-9 lin. lata, superiora minora. Pedunculus 6-9-pollicaris sæpissime monocephalus ante anthesin apice cernuus. Perianthium flavum inodorum campanulatum 1½-2 poll. longum extus viridulum, segmentis omnibus acutis, exterioribus oblanceolato-oblongis 4-6 lin. latis, interioribus latioribus magis obovatis. Stamina perianthio triplo breviora, antheris luteis 4-5 lin. longis filamentis concoloribus basi leviter applanatis dense barbatis æquilongis vel brevioribus. Ovarium ampullæforme 6-7 lin. longum, collo angustato, stigmatibus parvis latitudine crassitiem ovarii haud superantibus. *Ab Anglia et Scandinavia ad Caucasum, Tauriam, Siciliam, et Hispaniam.*—T. TURCICA, *Roth, Catal.* i. 45; *Sweet, Brit. Flow. Gard.* t. 186, *non Kunth.*—T. REPENS, *Fisch. Sweet, Brit. Flow. Gard.* ser. ii. t. 97; *Kunth, Enum.* iv. 224.—T. FLORENTINA *hort.* et T. MARSHALLIANA, *Andrz.* sunt formæ grandifloræ; et T. APENNINA, *Clus. Hist.* 150; T. BOLONIENSIS FLORE LUTEO, *Parkins. Parad.* 53, t. 2; et T. PUMILA, *Moench, Hort. Marb.* 301, sunt formæ bifloræ.



34. *T. FRAGRANS*, *Munby, Bull. Bot. Sc. France*, xiii. 256. Bulbus ovoideus 6-9 lin. crassus, tunicis brunneis intus glabris. Caulis  $\frac{1}{2}$ -pedalis monocephalus glaber. Folia 3 prope medium caulis conferta ascendentia glaucescentia lineari-lorata acuta, inferiora 6-8 poll. longa 4-6 lin. lata. Perianthium diutine erectum flavum infundibuliformi-campanulatum 12-18 lin. longum insigniter suaveolens, segmentis omnibus acutis oblanceolato-oblongis medio 4-6 lin. latis. Stamina perianthio ultra dimidium breviora, antheris luteis 3 lin. longis filamentis base dense barbatis brevioribus. Ovarium 5-6 lin. longum, collo angustato, stigmatibus parvis. *Algeria prope Oran, Munby! Balansa, 211! Ad sylvestrem arctissime accedit. V. v. in Hort. Kew.*

35. *T. BIEBERSTEINIANA*, *Schult. fl. Syst.* vii. 382; *Kunth, Enum.* iv. 224.—*T. sylvestris, Pallas, Iter*, i. 148, in *Bieb. Flor. Taur.* i. 270, non *L.*—*T. sylvestris*  $\beta$ . minor, *Led. Fl. Ross.* iv. 136.—*T. sylvestris*  $\beta$ . *Biebersteiniana, Regel, Enum.* 42, excl. *syn.*—*T. pumila, Tausch. Bot. Zeit.* 1829, *Ergbl.* 47, non *Moench.*—*T. Celsiana, Henning, Mém. Soc. Mosc.* vi. 70, non *DC.* Bulbus ovoideus 6-9 lin. crassus, tunicis sordide brunneis intus apice dense lanosis. Caulis glaber flexuosus semipedalis monocephalus. Folia 2-3 infra medium scapi imposita ascendentia glaucescentia canaliculata glabra, inferiora 5-6 poll. longa 3-6 lin. lata. Pedunculus 3-4-pollicaris ante anthesin cernuus. Perianthium infundibuliformi-campanulatum 12-15 lin. longum, intus flavum, extus viridi suffusum, segmentis omnibus acutis medio 3-6 lin. latis, interioribus latioribus. Stamina perianthio duplo breviora, antheris  $1\frac{1}{2}$ -2 lin. longis, filamentis applanatis basi barbatis dimidio vel triente brevioribus. Ovarium ampullæforme 3-4 lin. longum collo angustato, stigmatibus parvis. *Rossia europæa austro-orientalis, Caucasus, Persia.*—*T. THIRKEANA, K. Koch in Tchih. Asia Minor*, ii. 532 (*nomen solum*).—*T. tricolor, K. Koch, olim, non Led.* ex *Bi-thynia*, legit *Dr. Thirke*, non vidi.—*T. SYLVESTRIS* var. *TURKESTANICA, Regel. Enum.* 43, est forma affinis vel eadem in *Turkestan* lecta.

Var. *AURANTIACA, Baker.* Elatior subpedalis, foliis 5, 3 superioribus anguste linearibus. Perianthium 13-14 lin. longum, extus et intus luteo-aurantiacum, nullo modo viridulo tinctum, segmentis latioribus obtusiusculis. *Persia prope Ispahan, Aucher-Eloy, 5373.*

36. *T. PATENS, Agardh in Schult. fl. Syst. Veg.* vii. 384 (1829).—*T. tricolor, Led. Fl. Alt.* ii. 33 (1830); *lc. Ross.* t. 135; *Bot. Mag.* t. 3887; *Kunth, Enum.* iv. 225.—*T. sylvestris*, var. *tricolor, Led. Fl. Ross.* iv. 136; *Regel, Enum.* p. 42, excl. *syn.* Bulbus ovoideus 6-9 lin. crassus, tunicis brunneis apice intus obscure pilosis. Caulis 3-9-pollicaris gracilis glaber flexuosus debilis monocephalus rarissime 2-cephalus. Folia 2-3 prope medium scapi imposita ascendentia glabra

- canaliculata lineari-lorata, inferiora 3-5 poll. longa 3-6 lin. lata. Pedunculus 2-3-pollicaris ante anthesin cernuus. Perianthium infundibuliformi-campanulatum 9-12 lin. longum intus albido-flavescens fundo luteo extus obscure viridulum, segmentis acutis oblongo-lanceolatis medio 3-4 lin. latis. Stamina perianthio dimidium breviora, antheris luteis  $1\frac{1}{2}$  lin. longis filamentis basi barbatis triente vel dimidio brevioribus. Ovarium 3 lin. longum collo angustato stigmatibus parvis. *Siberia centralis meridionalis ad montes Altai, Songariae, &c., alt. 1000-5000 pedes.*
37. *T. BIFLORA*, *Linn. Suppl.* 196; *Pallas, Iter*, iii. 584; *Lindl. Bot. Reg.* t. 535; *Regel, Enum.* 44.—*Orithyia biflora*, *Kunth, Enum.* iv. 227.—*T. sylvestris*, var. *biflora*, *Led. Ross.* iv. 136. Bulbus ovoideus 9-12 lin. crassus, tunicis intus superne parce lanosis. Caulis 3-6-pollicaris gracilis glaber, raro 1-, sæpe 2-3-, raro 4-5-cephalus. Folia 2-3, supremum sæpe ad furcam caulis impositum, patentia plana canaliculata glaucescentia glabra lineari-lorata 3-6 poll. longa 3-6 lin. lata. Perianthium infundibuliformi-campanulatum 6-9 lin. longum intus albidum fundo luteum extus viridulo tinctum, segmentis acutis oblanceolato-oblongis medio 3-4 lin. latis. Stamina perianthio dimidium breviora, antheris oblongis  $1\frac{1}{2}$  lin. longis filamentis applanatis basi ciliatis  $\frac{1}{2}$ - $\frac{2}{3}$  brevioribus. Ovarium ampullæforme 3-4 lin. longum, in stylum brevissimum vel subnullum angustatum, stigmatibus parvis. *Ab Caucaso et ditone Volgensi ad Turcomaniam et montes Altai.*
38. *T. HUMILIS*, *Herbert, Bot. Reg.* 30; *Misc.* 30.—*T. Buhseana*, *Boiss. Diag.* ser. 2, iv. 98.—*T. biflora*, var. *Buhseana*, *Regel, Enum.* 44. Bulbus 6-9 lin. crassus, tunicis brunneis apice sericeis. Caulis 2-3-pollicaris gracilis glaber monocephalus. Folia 3-4 prope medium caulis conferta linearia canaliculata haud undulata, majora 3-4-pollicaria. Pedunculus 1-2-pollicaris ante anthesin apice subcernuus. Perianthium infundibuliformi-campanulatum 9-12 lin. longum luteum extus rubellum, segmentis omnibus acutis oblanceolato-oblongis medio 4-6 lin. latis, interioribus distincte latioribus. Antheræ 2 lin. longæ, filamentis leviter applanatis basi barbatis brevioribus. Ovarium ampullæforme 4-5 lin. longum, stigmatibus parvis. *Montes Persie borealis, alt. 5000-7000 pedes, Kotschy, 105! Buhse, Szovits.*
39. *T. MICROGYNÆ*, *Baker*. Bulbus globosus semipollicem crassus, tunicis teneris brunneis intus apice leviter pilosis. Caulis 4-5-pollicaris gracilis glaber monocephalus. Folia 4 infra medium caulis imposita omnia linearia, infimum canaliculatum obtusiusculum  $2\frac{1}{2}$ -3 poll. longum 3 lin. latum, superiora minora acuminata. Pedunculus gracillimus  $2\frac{1}{2}$ -3-pollicaris. Perianthium infundibuliforme 11-12 lin. longum, intus luteum. extus rubello tinctum, segmentis oblanceolato-spathulatis acutis vel acuminatis medio 2-3 lin. latis unguibus ciliatis.

Stamina perianthio dimidium breviora, antheris oblongis 1 lin. longis filamentis deorsum barbatis quadruplo brevioribus. Ovarium  $2\frac{1}{2}$  lin. longum, staminibus duplo brevius, ampullaceum, apice substylosum. stigmatibus parvis. *Mount Ida*, Aucher-Eloy in herb. DC.

40. T. AUSTRALIS, *Link in Schrad. Journ.* ii. 317 (1799).—T. *Celsiana*, DC. in *Red. Läl.* t. 38 (1802); *Schult. fl. Syst.* vii. 382; *Kunth, Enum.* iv. 224; *Reich. Ic. Germ.* t. 984.—T. *transtagana*, *Brot. Fl. Lus.* i. 519 (1804).—T. *Breyntiana*, *Bot. Mag.* t. 717.—T. *maculata*, *Roth, Nov. Sp.* 196; *Kunth, Enum.* iv. 225.—T. *sylvestris*, *Gouan et Desf. non Linn.*—T. *narbonensis* et *lusitanica*, *Parkins. Parad.* 152 (1629). Bulbus ovoideus 6–9 lin. crassus, post anthesin stoloniferus, tunicis castaneis intus glabris. Caulis  $\frac{1}{2}$ –1-pedalis sæpissime monocephalus gracilis glaber. Folia 2–3 infra medium scapi conferta glabra glaucescentia canaliculata, inferiora lanceolata 6–9 poll. longa 6–12 lin. lata, superiora angustiora. Pedunculus 3–6-pollicaris ante anthesin cernuus. Perianthium 9–15 lin. longum infundibuliformi-campanulatum luteum extus rubellum, segmentis oblanceolato-oblongis acutis medio 3–4 lin. latis apice leviter puberulis. Stamina perianthio dimidium breviora, antheris luteis 3–4 lin. longis, filamentis leviter applanatis basi barbatis subæquilongis. Ovarium ampullæforme 5–6 lin. longum collo angustato, stigmatibus parvis. *Lusitania, Hispania, Gallia meridionalis, et Sabaudia.*—T. ALPESTRIS, *Jord. et Four. Brev.* 120, ex Alpibus Delphinati, dicitur differre perianthii basi contractiore, laciniis omnibus basi ciliatis, exterioribus superne minus angustatis, antheris fuscis haud luteis, ovario superne fusco nec viridi, cauleque folia haud superante.

41. T. CRISPATULA, *Boiss. et Buhse, Reise Transcauc.* 211. Bulbus tunicis fuscis teneris intus parce lanosis. Caulis vix semipedalis supra medium foliis 2–3 instructus. Folia lanceolata canaliculata acuminata margine undulato-crispula ciliolata recurvata 2–3 poll. longa 4–5 lin. lata. Perianthium 10–11 lin. longum, luteum, extus roseum, segmentis acutis oblanceolato-oblongis 3 lin. latis, interioribus basi ciliatis. Antheræ flavæ. Filamenta antheris subæquilonga basi subangustata ciliata flava, superne longe attenuata. *Persia inter Damgan et Bischin*, Buhse. (Non vidi.)

42. T. GALLICA, *Lois. Gall.* i. 241; *Herb. Amat.* t. 160; *Kunth, Enum.* iv. 224; *Gren. Fl. Franc.* iii. 178.—T. *acrocarpa*, *Jord. MSS.* Bulbus ovoideus 6–9 lin. crassus tunicis sordide brunneis apice tenuiter sericeis. Caulis gracilis  $\frac{1}{2}$ –1-pedalis glaber. Folia 2–3 prope basin scapi imposita ascendente plaua glaucescentia glabra canaliculata anguste lorata, inferiora 6–9 poll. longa 6–9 lin. lata. Pedunculus 4–9-pollicaris ante anthesin apice cernuus. Perianthium infundibuliformi-campanulatum flavum leviter odorum 12–18 lin. longum extus

obscure rubellum, segmentis omnibus acutis, exterioribus oblanceolato-oblongis 3-5 lin. latis, interioribus latioribus magis obovatis. Stamina perianthio bis triente breviora, antheris luteis  $2\frac{1}{2}$ -3 lin. longis filamentis basi valde applanatis lanceolatis leviter barbatis brevioribus. Ovarium ampullæforme 5-6 lin. longum, collo attenuato, stigmatibus parvis. *Galloprovincia ad Draguignan, Hyères, &c.*, Perreymond! Dr. Franklin Gould! per mensem Aprilis florens.

43. T. ORPHANIDEA, *Boiss. in Orph. Pl. Græc. Easic. no. 843; Held. in Regel, Gartenfl. 1862, 309, t. 373. figs. 1, 2.*—T. Orphanidesii *hort. Angl.*—T. Minervæ et atheniensis, *Orphan. MSS.*—T. sylvestris, var. Orphanidea, *Regel, Enum. pp. 43.* Bulbus ovoideus 9-12 lin. crassus stoloniferus, tunicis intus apice brunneo-sericeis. Caulis  $\frac{1}{2}$ -1-pedalis monocephalus glaber. Folia 2-3 infra medium caulis conferta lineari-lorata acuta plana glaucescentia canaliculata glabra, inferiora 4-6 poll. longa 6-9 lin. lata. Perianthium infundibuliformi-campanulatum, 18-21 lin. longum, luteum, extus rubellum, segmentis omnibus acutis apice obscure puberulis, exterioribus medio 4-5, interioribus medio 6-7 lin. latis. Stamina perianthio bis triente breviora, antheris luteis 3 lin. longis filamentis valde applanatis basi barbatis sub dimidium vel trientem brevioribus. Ovarium ampullæforme 6-7 lin. longum collo angustato, stigmatibus parvis. *Græcia in monte Hymetto etc. ad finem Martii florens*, Orphanides; Von Heldreich! Inter *sylvestrem* et *australem* medium tenens.—T. GRISEBACHIANA, *Pantosek, Oest. Bot. Zeit. 1873, p. 255, e Herzegovina, ex descriptione, est verisimiliter planta affinis.*

44. T. CRETICA, *Boiss. & Held. Diagn. xiii. 19.*—T. sylvestris, var. cretica, *Regel, Enum. p. 43 ex parte.* Bulbus ovoideus 6-8 lin. crassus, tunicis sordide brunneis intus apice tenuiter adpresse pilosis. Caulis 2-3-pollicaris gracilis glaber monocephalus. Folia 2-3 prope basin caulis conferta falcata patentia glabra canaliculata, inferiora interdum lanceolata 2-3 poll. longa infra medium 5-6 lin. lata, superiora vel omnia linearia 2-3 lin. lata acuminata. Pedunculus 1-1 $\frac{1}{2}$ -pollicaris. Perianthium infundibuliforme 8-12 lin. longum, intus albidum, extus rubro tinctum, segmentis acutis oblanceolato-oblongis medio 3-5 lin. latis, interioribus distincte latioribus. Stamina perianthio duplo breviora, antheris oblongis 1 lin. longis filamentis dense barbatis 3-4plo brevioribus. Ovarium ampullaceum 3-4 lin. longum, stigmatibus parvis. *Creta in omnibus montibus excelsis*, Sieber! Von Heldreich!

45. T. LOWNEI, *Baker.* Bulbum non vidi. Caulis glaber 2-cephalus profunde furcatus 2-3-pollicaris. Folia 2 prope furcam caulis conferta patentia falcata glabra canaliculata lanceolata 3-4 poll. longa supra basin 6-12 lin. lata. Pedicelli 1 $\frac{1}{2}$ -2-poll. apice recti vel subcernui.

Perianthium 9-14 lin. longum infundibuliformi-campanulatum intus albedo-luteum, extus valde rubello tinctum, segmentis acutis oblanceolato-oblongis medio 3-4 lin. latis. Stamina perianthio duplo breviora, antheris oblongis 1 lin. longis filamentis albidis basi leviter barbatis 4plo brevioribus. Ovarium ampullæforme 4-5 lin. longum, collo angustato, stigmatibus parvis. *Palæstina ad cacumen montis Hermon, Lowne!*

Var. *HAYNEI, Baker.* Caulis uniflorus, floribus minoribus (8-9 lin. longis) pallidioribus, segmentis basi intus cite luteis, antheris paulo longioribus. *Palæstina ad Libanum, Hayne!*

46. *T. UNIFLORA, Besser in Herb. Kew.*—*Ornithogalum uniflorum, Linn. Mant. 62; Willd. Sp. ii. 111.*—*Gagea uniflora, G. Don, Loud. Hort. Brit. 134; Schult. fil. Syst. Veg. vii. 553.*—*Orithyia uniflora, D. Don in Sweet, Brit. Flow. Gard. ser. ii. t. 336.* Bulbus ovoideus 6-9 lin. crassus, tunicis membranaceis brunneis intus glabris secus basin caulis productis. Scapus 3-6-pollicaris gracilis flexuosus glaber monocephalus. Folia 2 prope basin scapi contigua patentia lineari-lorata glaucescentia glabra canaliculata 3-5 poll. longa 3-6 lin. lata haud undulata. Pedunculus 1-2-pollicaris ante anthesin cernuus. Perianthium infundibuliforme 8-12 lin. longum, intus luteum, extus viridulo tinctum, segmentis oblanceolato-oblongis obtusis vel acutiusculis supra medium 3-4 lin. latis. Stamina perianthio dimidium vel in floribus minoribus trientem breviora. Antheræ luteæ 1-1½ lin. longæ, filamentis glabris basi obscure barbatis  $\frac{3}{4}$ - $\frac{4}{5}$  brevioribus. Ovarium ampullaceum 2-3 lin. longum, in stylo erecto subæquilongo attenuatum, stigmatibus parvis. *Siberia centralis meridionalis ad montes Altai, &c.*—*ORITHYIA NUTANS, Trautl. Mag. 15, t. 10, est forma grandiflora floribus diutine nutantibus segmentis obtusis.*—*O. OXYPETALA, Kunth, Enum. iv. 227 (Tulipa heteropetala, Led. Ic. Ross. t. 85), est forma angustifolia perianthii segmentis acutis medio 2½ lin. latis.*

47. *T. HETEROPHYLLA, Baker.*—*Orithyia heterophylla, Regel, Enum. Semenow, 117.* Bulbus glaber, tunicis fuscis. Scapus erectus glaber uniflorus 2-3-pollicaris. Folia 2 subopposita erecto-patentia glabra scapo breviora, inferum ovato-lanceolatum, superum lineari-lanceolatum. Perianthium intus albidum, extus virescens, segmentis erectis oblongo-lanceolatis obtusiusculis. Stamina pistillum paulo superantia, filamentis glabris basi dilatatis, antheris lineari-oblongis triplo brevioribus. Ovarium oblongo-ampullaceum, stylo ovario æquilongo. *Alatau transiliensis, alt. 7000-8000 pedes, Semenow.*

48. *T. EDULIS, Baker.*—*Orithyia edulis, Miquel, Ann. Mus. Lug. Bat. iii. 158.*—*O. oxypetala, A. Gray, Bot. Morrow, 322; Miquel, loc. cit. non Kunth.* Bulbus ovoideus 6-9 lin. crassus, tunicis brunneis teneris

intus dense lanosis. Caulis gracillimus semipedalis glaber debilis 1-2-cephalus. Folia sæpe 6, 2 parva linearia prope apicem rami opposita vel alterna, inferiora lineari-lorata glabra canaliculata flaccida 9-12 poll. longa 3-4 lin. lata, flores longe superantia. Perianthium infundibuliforme 10-16 lin. longum, intus albidum, extus rubellum, venis verticalibus rubellis distinctis, segmentis lanceolatis acutis vel acutiusculis medio  $2\frac{1}{2}$ -3 lin. latis. Stamina perianthio subduplo breviora, antheris oblongis  $1\frac{1}{2}$  lin. longis, filamentis glabris albidis triplo brevioribus. Ovarium ampullæforme 2 lin. longum, in stylum longiorem angustatum, stigmatibus parvis. *Japonia prope Yokohama et Nagasaki*, Morrow et Williams, Oldham, 945! Dickens!

Species dubia.

49. *T. OXYPETALA*, *Stev. Taur.* 333. "Glabra, caule trifolio, foliis margine subundulatis anguste marginatis, inferioribus ovato-lanceolatis, filamentis glaberrimis anthera duplo brevioribus, perigonii foliolis omnibus subæqualiter acutatis, interioribus erectis, exterioribus apice patentibus. Flos roseus debile odoratus. Antheræ reliquis majores fere semiunciales; filamenta basi dilatata apice livida. A *T. Clusiana* differt foliis duplo latioribus." *Tauria, in campestribus rarior.*

4. *ERYTHRONIUM*, *Linn.*

*Gen.* no. 414; *Endl. Gen.* no. 1090; *Kunth, Enum.* iv. 217.

*Perianthium* corollinum 6-partitum, segmentis subæqualibus lanceolatis circa ovarium diutine conniventibus, supra ovarium arcte reflexis, marcescentibus, interioribus sæpe basi callosis et auriculatis. *Stamina* hypogyna vel obscure perigyna perianthio dimidium breviora, filamentis applanatis apice acuminatis, antheris elongatis basifixis basi profunde perforatis secus margines dehiscentibus. *Ovarium* breviter stipitatum oblongum triloculare, ovulis in loculo pluribus biseriatis; stylus filiformis interdum leviter declinatus, apice stigmatoso breviter tricuspideus vel indivisus. *Capsula* obovoidea membranacea obtuse angulata loculicide trivalvis, seminibus turgidis oblongis pendulis apice raphe excurrente in caudiculam producta strophiolatis, testa lutescente rugulosa.—*Herbæ bulbosæ, caulibus supra basin foliis 2 oppositis latis carnosis instructis, pedunculis elongatis nudis, floribus speciosis sæpissime solitariis,*

Stylus apice stigmatoso, sæpissime vel semper tricuspidatus.

*Gerontogea* floribus roseo-purpureis, interdum albis.

1. *dens-canis*.

Americana occidentalis floribus flavis ..... 2. *grandiflorum*.

Americana orientalis floribus albidis..... 3. *albidum*.

Stylus apice stigmatoso indivisus.

Grandiflora antheris elongatis ..... 4. *americanum*.

Parviflora antheris minutis ..... 5. *propullans*.

1. E. DENS-CANIS, *L. Sp.* 437 (excl.  $\gamma$ ); *Jacq. Austr.* t. 9; *Red. Lil.* t. 94; *Bot. Mag.* t. 5; *Reich. Germ.* t. 973; *Sweet, Flow. Gard.* ser. ii. t. 71; *Kunth, Enum.* iv. 217.—E. maculatum, *Lam. Gall.* iii. 286.—E. ovatifolium, *Poir. Encyc.* viii. 660. Bulbus ovoideo-cylindricus membranaceo-tunicatus, bulbillis sessilibus. Folia 2 opposita supra basin caulis imposita ovato- vel oblongo-lanceolata 2-4 poll. longa  $\frac{3}{4}$ -1 $\frac{1}{2}$  poll. lata glauca purpureo maculata in petiolum canaliculatum 1-2 poll. longum angustata. Pedunculus 3-4-pollicaris ebracteatus. Perianthium cernuum solitarium roseum vel violaceo-purpureum, raro album, 1-1 $\frac{1}{4}$  poll. longum, segmentis lanceolatis supra basin valde reflexis medio 3-5 lin. latis prope basin brunneo maculatis, interioribus tuberculis 4 patelliformibus callosis auriculatis. Stamina perianthio duplo breviora, antheris filamentis paulo brevioribus. Stylus 5-6 lin. longus apice leviter tricuspidatus. Capsula obovoidea obtuse angulata stipitata. *Per Europam centralem et meridionalem totam.*—E. LONGIFOLIUM, *Miller (Dict. no. 2)*, *Sweet (Flow. Gard.* ser. ii. t. 676), *Kunth (Enum.* iv. 217), est forma hortensis foliis longioribus acutioribus, floribus majoribus (2 poll. longis), cuspidibus stigmatosis profundioribus apice emarginatis.

Var. SIBIRICUM, *Fisch. & Meyer, Ind. Sem. Petr.* vii. 47; *Led. Ross.* iv. 134; *Kunth, Enum.* iv. 668.—E. altaicum, *Besser in Herb. Kew.* Robustius 6-9-pollicare, floribus majoribus 1 $\frac{1}{2}$ -2 poll. longis, callis segmentorum internorum protuberantia lineari transversali medio subcrenata connexis, cuspidibus stigmatosis apice emarginatis. *Siberia ad montes Altai, &c.*

Var. JAPONICUM, *Baker.* Perianthium violaceo-purpureum 12-15 lin. longum, segmentis basi macula nigricante distincta tridentata notatis. Stylus 7 lin. longus ovarium 3-4plo superans apice leviter tricuspidatus. *Japonia, prope Hakodadi, Hodgson!*

2. E. GRANDIFLORUM, *Pursh, Flora,* i. 231; *Schult. fl. Syst.* vii. 374; *Lindl. Bot. Reg.* t. 1786; *S. Wats. Bot.* 40 *Parall.* 348. Bulbus elongato-ovoideus 6-9 lin. crassus, tunicis membranaceis sursum productis. Folia oblongo-oblancoolata 4-5 poll. longa 9-18 lin. lata acuta vel obtusiuscula basi in petiolum brevem angustata imma-

culata impunctata. Pedunculus 3-6-pollicaris monocephalus apice cernuus. Perianthium flavum 12-18 lin. longum, segmentis lanceolatis acutis 2-3 lin. latis ex apice ovarii reflexis immaculatis, interioribus basi obscure auriculatis. Stamina perianthio dimidium vel ultra breviora, antheris flavis 3-4 lin. longis filamentis brevioribus. Stylus 5-6 lin. longus apice indivisus vel distincte tricuspidatus. Capsula anguste obovoidea 9-12 lin. longa obtuse angulata. *Montes Scopulosi America borealis et California.*

Var. GIGANTEUM, *Hooker, Flor. Bor. Am.* ii. 182.—*E. giganteum*, *Lindl. Bot. Reg.* sub t. 1786; *Bot. Mag.* t. 5714.—*E. maximum*, *Douglas, MSS.*—*E. speciosum*, *Nuttall, MSS.*—Elatior foliis latioribus, floribus majoribus 1-6 flavis, segmentis 3-6 lin. latis. *Montes Scopulosi, alt. 6000-10000 pedum, ad Californiam et insulam Vancouver.*

Var. REVOLUTUM, *Hook.*—*E. revolutum*, *Smith, Rees's Cyclop.* Pedunculus subpedalis. Perianthium solitarium roseo-purpureum 15-18 lin. longum. Stylus breviter tricuspidatus. *Nootka, Menzies!*

Var. MULTIFLORUM, *Torrey, Bot. Whipple, 90.* Flores 1-15 lilacini parvi 6-7 lin. longi. Stamina multo minora. Stylus 3 lin. longus apice obscure trilobatus. *California, Bigelow!*

3. *E. ALBIDUM*, *Nuttall, Gen.* i. 233; *Schult. fl. Syst.* vii. 374; *Kunth, Enum.* iv. 218; *Gray, Man.* edit. 5, 533. Bulbus ovoideus 12-15 lin. crassus stoloniferus. Caulis 6-9-pollicaris. Folia oblongo-lanceolata 4-6 poll. longa, 1-1½ poll. lata, subacuta, paullulum maculata impunctata. Perianthium solitarium subcernuum albidum vel leviter cærulescens, 12-18 lin. longum, segmentis lanceolatis supra basin reflexis 2-3 lin. latis, interioribus exauriculatis. Stamina perianthio dimidio breviora, antheris filamentis dimidio brevioribus. Stylus 4-5 lin. longus apice leviter tricuspidatus. *Civitates Fæderatæ America borealis a Canada ad Wisconsin et Illinois.* Adest, teste A. Gray *loc. cit.*, ad Lacum Superiorem varietas floribus flavis ad *E. grandiflorum* vergens.—*E. BRACTEATUM*, *Bigelow (in Beck, Bot. 365)*, *Kunth (Enum. iv. 219)*, est verisimiliter forma nemorosa hujus speciei foliis magnis oblanceolatis, flore parvo, pedunculo prope apicem bractea minuta lineari instructo. *Exempla originalia Boothiana a Vermont adsunt in hb. Kew. et D.C.*

4. *E. AMERICANUM*, *Smith, Rees's Cyclop.*; *Gawl. Bot. Mag.* t. 1113; *Bigelow, Med. Bot.* iii. 151, t. 58; *Kunth, Enum.* iv. 218.—*E. denscanis* γ, *Linn. Sp.* 437; *Red. Lil.* t. 194.—*E. aquatile*, *Salisb. Hort. Trans.* i. 331.—*E. lanceolatum*, *Pursh, Flora,* i. 230. Bulbus ovoideus stoloniferus. Folia oblongo-lanceolata 4-6 poll. longa acuta basi in petiolum angustata pallide viridia purpureo et albido punctata et maculata. Pedunculus monocephalus 4-6-pollicaris. Perianthium



flavum extus interdum purpurascens 12-18 lin. longum, segmentis lanceolatis obtusis 2-4 lin. latis, sæpissime supra basin fusco maculatis, interioribus auriculatis. Stamina perianthio dimidium breviora, antheris linearibus 3 lin. longis. Stylus 6 lin. longus clavatus e basi ad apicem subintegrum sensim incrassatus. Capsula obovoideo-subglobosa brevissime stipitata. *America borealis orientalis a Canada ad Floridam et Texas.*—E. CAROLINIANUM, *Walt.* (*Carol.* 122), *Kunth* (*Enum.* iv. 219), est forma foliis vix oppositis.—E. NUTTALLIANUM, *Schult. fil.* (*Syst.* vii. 1681), *Kunth* (*Enum.* iv. 218), *Regel* (*Gartenflora*, t. 695. fig. 1, 2), est forma auriculis perianthii segmentorum internorum obsoletis.

5. E. PROPULLANS, *A. Gray*, *Amer. Nat.* 1871, 298, t. 74. Bulbus parvus ovoideus profunde hypogæus apicem partis subterraneæ caulis stolonem propullans. Folia oblongo-lanceolata 2-3 poll. longa leviter maculata acuta basi longe angustata. Pedunculus gracillimus 2-3 poll. longus, monocephalus. Perianthium 5-6 lin. longum roseo-purpureum, segmentis lanceolatis acutis  $1\frac{1}{2}$  lin. latis basi flavo-maculatis exauriculatis nullo modo callosis. Stamina inæqualia, longiora perianthio triente breviora, antheris oblongis  $\frac{1}{2}$  lin. longis. Stylus indivisus 2-2 $\frac{1}{2}$  lin. longus ovarium superans. Ovarium obovoideum 4 ovulis in loculo 4-6. *Minnesota*, Mrs. Hedges! Miss Darlington!

##### 5. LLOYDIA, *Salisb.*

*Gen.* 51; *Reich. Fl. Germ.* 102; *F. Nees, Gen. Flor. Germ.* iv. t. 19; *Endl. Gen.* no. 1094; *Kunth, Enum.* iv. 243.—Nectarobothrium, *Led. Fl. Alt.* ii. 36.—Rhabdocrinum, *Reich. Conspect.* no. 1352.—Antherici sp., *Linn.*—Phalangii sp., *Poir.*—Gageæ sp., *Schult. fil.*, &c.

*Perianthium* 6-partitum diutine infundibuliforme, segmentis oblanceolatis marcescentibus rectis interdum unguibus obscure foveolatis. *Stamina* 6 hypogyna perianthio distincte breviora, filamentis filiformibus rectis, antheris oblongis basifixis basi profunde perforatis secundum marginem totum dehiscentibus. *Ovarium* sessile oblongo-cylindricum triloculare, ovulis in loculo crebris biseriatis; stylus rectus brevis, apice stigmatoso capitatus. *Capsula* membranacea obovoidea loculicide trivalvis obtuse angulata, seminibus parvis subcompressis dimidiato-oblongis, testa tenui castanea.—*Herbæ humiles bulbosæ, foliis duris graminoidis, floribus albidis parvis.*

Subgenus EULLYDIA. *Bulbus obliquus subrhizomatosus. Segmenta unguibus foveolatis.*

Species sola ..... 1. *serotina*.

Subgenus GAGEOPSIS\*. *Bulbus rectus globosus. Segmenta unguibus haud foveolatis.*

Folium radicale solitarium 3-4 lin. latum ..... 2. *triflora*.

Folium radicale sæpissime solitarium 1-1½ lin. latum.

3. *rubro-viridis*.

Folia radicalia pauca 1 lin. lata ..... 4. *græca*.

1. *L. SEROTINA*, Reich. *Germ. Excurs.* 102; *Kunth, Enum.* iv. 244; *Eng. Bot. edit.* 3, t. 1521.—*Anthericum serotinum*, *L. Sp.* 444; *Eng. Bot.* t. 793.—*Phalangium serotinum*, *Poir. Enc.* v. 241; *Red. Lil.* t. 270.—*Gagea serotina*, *Ker, Journ. Scien.* ii. 180.—*Ornithogalum striatum*, *Willd. Sp.* ii. 112.—*Nectarobothrium striatum*, *Led. Alt.* ii. 36.—*Ornithogalum altaicum*, *Laxm. Nov. Comm. Act. Petrop.* viii. 530, t. 7. fig. 1.—*L. alpina*, *Salisb.*—*L. longiscapa*, *Hook. Ic.* t. 834.—*L. himalensis*, *Royl. Ill.* 388, t. 93. fig. 2; *Kunth, Enum.* iv. 672. *Bulbus obliquus subrhizomatosus perennis tunicis membranaceis cinctus apice longe productis. Folia radicalia 2-4 linearia dura convoluta caulem superantia vel breviora. Caulis sæpissime monocephalus, interdum 2-3-cephalus, 3-9-pollicaris, foliis 3-4 parvis linearibus instructus. Perianthium expansum erectum 6-8 lin. longum albidum basi luteo-purpureum, segmentis oblanceolatis obtusis 1½-2 lin. latis viridulo-purpureo venosis, unguibus nectario viridi obscuro glabro foveolatis. Stamina perianthio triente breviora, antheris minutis oblongis. Stylus ovario æquilongus. Capsula obovoidea 3 lin. longa obtuse angulata. Ab montibus Cambriæ et Delphinati ad Siciliam, Himalayas, et Montes Scopulosos Americæ borealis, distributio latissima omnium Liliacearum.—NECTAROBOTHRIMUM REDOWSKIANUM, *Schlecht. & Cham. Linnæa*, vi. 585, est forma gracilis segmentis perianthii vix ultra lineam latis.—LLOYDIA SICULA, *Huet du Pav. Pl. Sic. Exsic.* No. 247, est forma elatior gracilis hujus speciei. De vegetatione vide *Wydler, Regensb. Flora*, 1859, p. 33, et *Irmisch, Bot. Zeit.* 1863, pp. 161-169, t. 6.*

2. *L. TRIFLORA*, *Baker*.—*Ornithogalum triflorum*, *Led. Mém. Acad. Petrop.* v. 529; *Ic.* t. 379.—*Gagea triflora*, *Schult. fil. Syst.* vii. 511; *Kunth, Enum.* iv. 142; *Led. Ross.* iv. 141; *Maxim. Prim. Amur.* 278. *Bulbus solitarius pisi magnitudine latere circa basin bulbillus pluribus tunica communi inclusis instructus. Folium radicale solitarium 6-9 poll. longum 3-4 lin. latum glabrum e medio utrinque attenua-*

\* Ab *Gageis* floribus corymbosis bracteis segregatis, inferioribus caulinis, præsertim differt perianthii segmentis albidis, venis purpurascensibus haud in carinam confertis.

tum. Caulis debilis semipedalis apice corymbosus 2-8-florus, infra vel ad furcam unam corymbi foliis 1-2 linearibus 2-3 poll. longis 3-4 lin. latis instructus. Pedicelli erecti 9-15 lin. longi medio vel basi foliis minutis linearibus 3-6 lin. longis bracteati. Perianthium infundibuliforme albidum  $4\frac{1}{2}$ -5 lin. longum, segmentis oblanceolatis  $1\frac{1}{2}$  lin. latis venis 3-5 verticalibus distantibus viridibus unguibus haud foveolatis. Stamina perianthio sub dimidium breviora, antheris minutis subrotundis. Stylus  $1\frac{1}{2}$  lin. longus, ovario æquilongus. Capsulam non vidi. *Siberia orientalis, Kamtschatka, insule Kurilenses.*

3. *L. RUBRO-VIRIDIS*, Baker.—*Gagea rubro-viridis*, Boiss. & Kotschy, *Diagn. ser. 2*, iv. 106. Bulbus ovoideus 3-4 lin. crassus membranaceo-tunicatus basi bulbiferus. Folia radicalia 1-2 anguste linearia graminoida glabra convoluta  $1-1\frac{1}{2}$  lin. lata cauli subæquilonga. Caulis 4-5-pollicaris apice corymbosus 3-4-cephalus, foliis 1-2 parvis linearibus 6-18 lin. longis supra medium impositis. Pedicelli erecti 6-15 lin. longi, basi vel medio foliis minutis linearibus bracteati. Perianthium infundibuliforme erectum 5-6 lin. longum album intus distincte purpureo tinctum, segmentis oblanceolatis obtusiusculis  $1\frac{1}{2}$ -2 lin. latis, in dimidio venis 3-5 longitudinalibus purpureis percursis, unguibus haud foveolatis. Stamina perianthio paulo breviora, antheris minutis flavis subglobosis. Stylus 3-4 lin. longus ovarium superans. Capsula anguste obovoidea 3 lin. longa apice truncata. *In regione alpina montium Palæstinæ (Hermon &c.), Kotschy! Gailardet! Hayne!*
4. *L. GRÆCA*, Endl. *Gen.* 140; *Kunth, Enum.* iv. 245.—*Anthericum græcum*, Linn. *Sp.* 444; *Sibth. & Sm. Fl. Græc.* t. 336; *Lab. Dec.* v. 12, t. 8. fig. 2.—*Phalangium græcum*, *Poir. Encyc.* v. 250.—*Lloydia cretica*, Boiss. in *Bal. Pl. Orient. Exsic.* 1854, No. 152. Bulbi cæspitiosi parvi globosi haud obliqui fibras copiosas emittentes, tunicis apice haud productis. Folia radicalia anguste linearia 2-4 caulem superantia vel breviora. Caulis 3-6-pollicaris 1-6-cephalus foliis 3-4 parvis anguste linearibus instructus. Perianthium primum cernuum, expansum, erectum, 5-9 lin. longum, infundibuliforme, albidum purpureo-venosum, segmentis oblanceolatis obtusis unguibus haud foveolatis. Stamina perianthio dimidium breviora, antheris minutis subrotundis. Ovarium cylindricum 3 lin. longum; stylus  $\frac{1}{2}$  lin. longus. Capsula anguste obovoidea membranacea 4 lin. longa obtuse angulata. *Montes Græciæ, Asiæ minoris, Cretæ, Cypri et insularum Ionicarum.*

Species exclusa.

LLOYDIA KUNAWARENSIS, Royle, *Ill.* t. 93. fig. 3. = *Gagea persica*, Boiss. = *Bulbillaria gageoides*, Zucc.

## 6. CALOCHORTUS, Pursh.

*Flor. Bor. Am.* i. 240; *Lindl. Bot. Reg.* sub t. 1661; *Schult. fil. Syst. Veg.* vii. 98 et 1530; *Endl. Gen.* 1095; *Kunth, Enum.* v. 231.—*Cyclobothra*, *Sweet, Brit. Flow. Gard.* t. 273; *Benth. Hort. Trans.* new series, i. 412; *Kunth, Enum.* iv. 227.—*Fritillariæ* sp. *H.B.K. Nov. Gen.* t. 677.

*Perianthium* 6-partitum, segmentis exterioribus sepaloideis viridibus lanceolatis, interioribus petaloideis obovato-cuneatis facie plus minus barbatis ad unguem supra basin foveola glandulosa rotundata instructis. *Stamina* 6, perianthio valde breviora æqualia obscure perigyna, antheris ligulatis vel oblongis basifixis obtusis vel acutis secus marginem totum dehiscentibus. *Ovarium* sessile triquetro-cylindricum triloculare, ovulis in loculo crebris biseriatis, stylo nullo, stigmatibus 3 brevibus recurvato-patentibus. *Capsula* membranacea septicide trivalvis, cylindrico-triquetra angulis obtusis, vel oblonga angulis profundis acutis. *Semina* parva discoidea semirotanda, testa albida nitida ad angulos in alas angustas producta. *Herbæ bulbosæ boreali-americanæ foliis anguste linearibus persistentibus, caulibus sæpe divaricato-ramosis, floribus speciosis, versicoloribus erectis vel pendulis infundibuliformibus vel globosis.*

Subgenus I. MACRODENUS. *Bulbus membranaceo-tunicatus. Petala profunde foveolata. Capsula oblonga.*

*Perianthium* expansum globosum nutans.

- Petala flava ..... 1. *pulchellus*.  
 Petala alba ..... 2. *albus*.

*Perianthium* expansum erectum infundibuliforme.

- Petala obovato-cuneata extrorsum rotundata.  
 Petala flava ..... 3. *Benthami*.  
 Petala pallide stramineo-lilacina.  
 Antheræ acutæ ..... 4. *elegans*.  
 Antheræ valde acuminatæ ..... 5. *apiculatus*.  
 Petala ovato-oblonga acuminata ..... 6. *Lyallii*.

Subgenus II. PLATYCARPUS. *Bulbus membranaceo-tunicatus. Petala leviter foveolata. Capsula oblonga.*

- Petala aurea ..... 7. *aureus*.  
 Petala straminea ..... 8. *Nuttallii*.  
 Petala lilacina vel purpurea.  
 Caulis semper monocephalus ..... 9. *uniflorus*.

Caulis oligocephalus.

Sepala facie distincte maculata ..... 10. *flexuosus*.

Sepala immaculata.

Parviflora antheris parvis ..... 11. *lilacinus*.

Grandiflora antheris magnis ..... 12. *nitidus*.

Subgenus III. CYCLOBOTHTA. *Bulbus fibroso-tunicatus. Petala leviter foveolata. Capsula angusta.*

Segmenta perianthii exteriora interioribus subsimilia haud sepaloidea ..... 13. *Hartwegii*.

Segmenta perianthii distincte dissimilia exteriora sepaloidea.

Petala purpurea ..... 14. *purpureus*.

Petala flava ..... 15. *flavus*.

Subgenus IV. MARIPOSA (*Calochortus, Kunth*). *Bulbus membranaceo-tunicatus. Petala leviter foveolata. Capsula angusta.*

Petala aurantiaca ..... 16. *luteus*.

Petala saturate lilacina.

Petala distincte cuspidata ..... 17. *macrocarpus*.

Petala haud vel vix cuspidata ..... 18. *splendens*.

Petala albida vel pallide lilacina vel straminea.

19. *venustus*. 20. *Gunnisoni*. 21. *Leichtlinii*.

Subgenus I. MACRODENUS, *Baker*. *Bulbus membranaceo-tunicatus. Folia in axillis haud bulbifera. Sepala immaculata. Petala profunde foveolata. Capsula oblonga profunde acute angulata. Pedicelli fructiferi deflexi. Calochortus, Pursh, non Kunth.—Cyclobothra, Benth. et Lindl. ex parte, non Sweet.*

1. C. PULCHELLUS, *Dougl. MSS.*; *Wood, Proc. Acad. Phil.* 1868, 168. —*Cyclobothra pulchella, Benth. Hort. Trans. nov. ser. i.* 415, t. 14. fig. 1; *Lindl. Bot. Reg. t.* 1662; *Kunth, Enum. iv.* 228. *Bulbus ovoideus membranaceo-tunicatus* 6–9 lin. crassus. *Caulis* 1–1½ pedalis 6–12-cephalus profunde furcatus, ramis divaricatis. *Folia infra furcam* 1–2 linearia modice firma 6–12 poll. longa, prope basin 6–12 lin. lata. *Bracteæ foliaceæ lineares acuminatæ* 1–4-pollicares. *Perianthium cernuum saturate flavum, sepalis oblongo-lanceolatis acutis* 6–9 lin. longis facie immaculatis, petalis late oblongis 12–15 lin. longis subobtusis profunde foveolatis secus margines et faciem totam præsertim ad medium flavo-barbatis. *Antheræ oblongæ obtusæ* 2 lin. longæ, filamentis paulo breviores. *Capsula oblonga* 12–15 lin. longa profunde angulata. *California, Douglas! Bridges, 282! Lobb, 240! Bigelow! &c.*

2. *C. ALBUS*, *Dougl. MSS.*; *Wood, Proc. Amer. Acad.* 1868, 168; *Maund, Bot.* ii. t. 98.—*Cyclobothra alba*, *Benth. Hort. Trans. nov. ser.* i. 413, t. 14. fig. 3; *Lindl. Bot. Reg.* t. 1661; *Kunth, Enum.* iv. 228; *Flora des Serres*, t. 1174; *Belg. Hort.* vii. p. 201, t. 32. Bulbus ovoideus 6-9 lin. crassus membranaceo-tunicatus. Caulis 1-1½-pedalis 3-12-cephalus profunde furcatus ramis divaricatis. Folia infra furcam 1-2, inferiora plana linearia modice firma 6-12 poll. longa 6-9 lin. lata. Bracteæ foliaceæ lineares acuminatæ 2-6-pollicares. Perianthium globosum album cernuum, sepalis oblongo-lanceolatis acutis immaculatis 9-12 lin. longis, petalis obovato-oblongis obtusis 15-18 lin. longis profunde foveolatis secus margines et faciem totam præsertim ad medium tenuiter albo-barbatis. Antheræ anguste oblongæ subacutæ, filamentis subtriplo breviores. Capsula late oblonga 12-15 lin. longa membranacea profunde acute angulata. *California*, Douglas! Coulter, 734! Bigelow! &c.
- Var.  $\beta$ . *PANICULATA*.—*Cyclobothra paniculata*, *Lindl. Bot. Reg. sub t.* 1662; *Kunth, Enum.* iv. 288. Humilior, foliis angustioribus, floribus minoribus. *California*, Douglas, Bridges 282! Coulter 730! Hartweg 1984!
3. *C. BENTHAMI*, *Baker*.—*Cyclobothra elegans*, var. *lutea*, *Benth. Pl. Hartw.* 338.—*Cyclobothra monophylla*, *Lindl. Herb.*—*Calochortus nitidus*, *Wood, Proc. Acad. Phil.* 1868, 169 non *Dougl.* Bulbus ovoideus, membranaceo-tunicatus 6-8 lin. crassus. Caulis 3-6-pollicaris 3-6-cephalus. Folia 1-2, inferius majus corymbum superans lineare 6-9 poll. longum 3-5 lin. latum acuminatum. Bracteæ lineares foliaceæ 1-3-pollicares. Perianthium erectum expansum infundibuliforme, sepalis oblongo-lanceolatis acutis immaculatis flavo-viridibus 6-9 lin. longis, petalis saturate luteis sepalis æquilongis sub-obtusis profunde foveolatis secus faciem totam et margines flavo-barbatis. Antheræ lanceolatæ acutæ 1½ lin. longæ filamentis flavis paulo breviores. Pedicelli fructiferi insigniter cernui. Capsula oblonga obtusa 6-9 lin. longa profunde acute angulata. *California*, Hartweg, 1982! Bigelow! Fremont, 353! 1846! W. Lobb, 241! Var. *cornutus*, *Wood*, est forma floribus solitariis, sepalis longe acuminatis petala excedentibus.
4. *C. ELEGANS*, *Pursh, Flora*, i. 240; *Dougl. Hort. Trans.* vii. t. 9. fig. B; *Hook. fil. Bot. Mag.* t. 5976; *Wood, Proc. Acad. Phil.* 1868, 168.—*Cyclobothra elegans*, *Lindl. Bot. Reg.* sub t. 1661; *Kunth, Enum.* iv. 229.—*C. cærulea*, *Kellogg, Proc. Acad. Calif.* ii. 4. Bulbus anguste ovoideus membranaceo-tunicatus 5-6 lin. crassus. Caulis gracilis 3-6-pollicaris umbellatim 3-6-cephalus. Folium solitarium lineare 6-9 poll. longum 3-4 lin. latum. Bracteæ foliaceæ lineares vel lanceolatæ 1-3-pollicares. Perianthium expansum erectum late infundibuliforme, sepalis viridibus lanceolatis acutis 6-8 lin. longis, petalis obovato-cuneatis 9-12 lin. longis obtusis vel leviter cuspidatis

albidis vel pallide lilacinis basi profunde maculato-foveolatis secus margines et faciem præsertim circa foveolam pilis pallidis barbatis. Antheræ acute 2-3 lin. longæ filamentis  $1\frac{1}{2}$ -2plo breviores. Pedicelli fructiferi insigniter deflexi. Capsula oblonga 9-12 lin. longa profunde acute angulata. *California*, Hartweg, 1986! Fremont, 360! 846! Jeffray, 976! *Missouri et Oregon*, Geyer, 299! Spalding! *Columbia britannica*, Douglas! Hinds! Var. **SUBCLAVATUS**, Baker (*California*, W. Lobb, 243) est forma parviflora petalis pilis paucis ad apicem foveolæ solum præditis. C. **TOLMIEI**, Hook. et Arn. Bot. Beech. 398 (*ad ripas fluv. Wallamet*, Tolmie!) est forma robusta grandiflora petalis secus faciem totam barbatis; var. **LOBBII**, Baker (*Oregon*, Lobb, 257), est forma similis antheris insigniter apiculatis; C. **MAWEANUS**, Hort. Leichtlin. (Bot. Mag. 5976. *California*, W. Lobb, 242!), est forma humilis pilosissima omnium, petalis prorsus faciem totam dense barbatis.

5. **C. APICULATUS**, Baker. Bulbus ovoideus membranceo-tunicatus. Caulis 1-1 $\frac{1}{2}$ -pedalis 1-9-cephalus. Folium solitarium planum lineare 6-12 poll. longum 3-9 lin. latum. Bracteæ lineares acuminatæ 1-3-pollicæ. Perianthium expansum late infundibuliforme erectum. Sepala lanceolata albedo-viridia acuta 8-9 lin. longa. Petala straminea late obovata obtusa 1 poll. longa distincte foveolata foveola dense barbata faciebus et marginibus pilis paucis præditis. Antheræ stramineæ 4 lin. longæ valde acuminatæ filamentis æquilongæ. Pedicelli fructiferi insigniter cernui. Capsula 12-15 lin. longa anguste oblonga. *Columbia britannica ad montes Pend Oreille et Kootenay*, Dr. Lyall! Fortasse varietas insignis *C. elegantis*.

6. **C. LYALLII**, Baker. Bulbus membranaceo-tunicatus. Caulis  $\frac{1}{2}$ -pedalis 2-3-cephalus. Folium solitarium lineare planum 5-6-poll. longum 3-4 lin. latum. Bracteæ lineares acuminatæ 6-9 lin. longæ. Perianthium erectum expansum late infundibuliforme. Sepala albo-viridia lanceolata acuminata 6-9 lin. longa. Petala alba sepalis paulo longiora ovato-acuminata profunde maculato-foveolata, secus margines et faciem totam barbata. Antheræ flavæ subacutæ 2 lin. longæ filamentis paulo longiores. Capsula immatura oblonga, stylo brevi, stigmatibus recurvato-patentibus. *Columbia britannica ad apicem montis alt. 5800 pedes inter fluv. Columbia et Yakima*, Dr. Lyall!

Subgenus II. **PLATYCARPUS**, Baker. Bulbus membranaceo-tunicatus. Folia in axillis haud bulbifera. Sepala interdum facie obscure maculata. Petala leviter foveolata. Capsula oblonga, profunde angulata. Pedicelli fructiferi erecti.

7. **C. AUREUS**, S. Wats. Amer. Nat. 1873, No. 5, p. 7. Caulis 4-6-pollicaris 1-2-cephalus, folio unico radicali lineari 3-4 poll. longo, bracteis

- linearibus 2 poll. longis. Sepala oblongo- vel ovato-lanceolata flavo-  
viridia facie prope basin purpureo-maculata. Petala obovato-cuneata  
15 lin. longa saturate flava, facie prope basin foveola dense barbata et  
supra basin macula purpurea instructa. Capsula immatura anguste  
oblonga. *Utah meridionalis in rupestribus arenosis*, Mrs. E. P.  
Thompson. (Non vidi.)
8. *C. NUTTALLII*, *Torrey & Gray, Bot. Betchw.* 124; *Wood, Proc. Phil. Acad.* 1868, 169; *S. Wats. Bot.* 40 *Parall.* 347.—*C. luteus*,  
*Nutt. Journ. Acad. Phil.* vii. 51, non *Dougl.* Bulbus ovoideus mem-  
branaceo-tunicatus. Caulis 9-18-pollicaris, umbellatim 1-4-cephalus,  
foliis linearibus profunde canaliculatis, infimis 6-9 poll. longis, 3-4  
lin. latis. Bracteæ lineares foliaceæ acuminatæ complicatæ 1-1½-  
pollicares. Perianthium late infundibuliforme erectum, sepalis lanceo-  
latis 6-12 lin. longis acutis facie leviter coloratis obscure purpureo-  
maculatis, petalis 12-18 lin. longis late obovato-cuneatis obtusis  
stramineis supra basin foveola dense barbata et supra foveolam medio  
laminæ macula glabra præditis. Antheræ flavæ obtusæ 3-4 lin. longæ  
filamentis paulo breviores. Capsula oblonga 6-9-lin. longa profunde  
angulata. *Montes Scopulosi (Idaho, Montana, Utah, California borealis)*,  
Nuttall! Burke! Bell, 33! Hall & Harbour, 529! &c.—*C. EURYCARPUS*,  
*S. Wats. Bot.* 40 *Parall.* 348, est verisimiliter forma magis alpina ejusdem speciei.—*C. PARVIFLORUS*, *Nuttall, MSS.*, est  
forma minor gracilior, petalis anguste obovatis subacutis 6 lin. longis  
longe a foveola supra medium laminæ maculatis.
9. *C. UNIFLORUS*, *Hook. et Arn. Bot. Beech.* 398, t. 94; *Wood. Proc. Phil. Acad.* 1868, 168, non *Bot. Mag.* t. 5804. Bulbus 3-4 lin. crassus  
membranaceo-tunicatus. Caulis gracilis 3-6-pollicaris semper mono-  
cephalus. Folia 3-4 linearia, inferiora scapo æquilonga, 2-3 lin. lata.  
Perianthium erectum, pedunculo nudo 2-5-pollicari. Sepala lanceolata  
acuta viridia immaculata 6-7 lin. longa. Petala 9-12 lin. longa late  
obovato-cuneata pallide lilacina foveola obscura purpurea supra basin  
et pilis numerosis supra foveolam præditis. Antheræ obtusæ 1½ lin.  
longæ filamentis subtriplo breviores. Ovarium oblongum. Capsulam non  
vidi. *California*, Douglas! Coulter, 735! Bolander, 4666!
10. *C. FLEXUOSUS*, *S. Wats. Amer. Nat.* 1873, No. 5, p. 7. Caulis  
superne flexuosus ramosus. Bracteæ lineari-lanceolatæ 6-15 lin. longæ.  
Sepala oblongo-lanceolata viridula, facie macula saturate purpureo-aurantiaca  
prædita. Petala late obovato-cuneata 12-15 lin. longa purpurea, ungue  
saturate purpureo, foveola obscura aurantiaco-purpurea supra unguem  
instructa, pilis glandulosis ad marginem attingentibus. Capsula anguste  
oblonga. *Utah et Arizona*, Mrs. E. P. Thompson. (Non vidi.)
11. *C. LILACINUS*, *Kellogg, Proc. Calif. Acad.* ii. 5.—*C. umbellatus*,



*Wood, Proc. Phil. Acad.* 1868, 168.—*C. uniflorus*, *Bot. Mag.* t. 5804, non *Hook. et Arn.* Bulbus ovoideus membranaceo-tunicatus. Caulis 4–6-pollicaris umbellatim 3–9-cephalus, pedicellis elongatis. Foliolum subradicale unicum lineare, supra corymbum multo eminens 4–6 poll. longum, 2–5 lin. latum. Bracteæ acuminatæ foliaceæ  $1\frac{1}{2}$ –3-poll. caeres. Perianthium erectum late infundibuliforme. Sepala lanceolata 6–7 lin. longa viridia, lilacino tincta, facie immaculata. Petala lilacina, obovato-cuneata, sepalis paulo longiora, foveola obscura supra unguem, et pilis paucis circa foveolam præditis, margine haud ciliata. Antheræ obtusæ  $1\frac{1}{2}$  lin. longæ, filamentis triplo breviores, polline cæruleo. Capsula parva oblonga erecta. *California*, Bigelow! *Bolander!* *Lobb*, 246! (forma floribus majoribus, petalis ad pollicem longitudine et latitudine attingentibus, pedicellis 4–5 poll. longis).

12. *C. NITIDUS*, *Dougl. Hort. Trans.* vii. 277, t. 9. fig. A; *Schult. fl. Syst. Veg.* vii. 1530; *Hook. Flor. Bor. Am.* ii. 183, non *Wood*.—*Cyclobothra nitida*, *Kunth, Enum.* iv. 230. Bulbum non vidi. Caulis erectus strictus  $1\frac{1}{2}$ –2-pedalis umbellatim 3–4-cephalus. Folia 2–3 ascendunt anguste linearia convoluta acuminata, inferiora 6–9-poll. basia 3 lin. lata. Bracteæ foliaceæ lineares acuminatæ. Perianthium erectum expansum late infundibuliforme, sepalis linearibus acuminatis 15–18 lin. longis, petalis obovato-spathulatis obtusis pallide lilacinis distincte foveolatis foveola dense barbata, secus faciem et margines pilis longis sparsis præditis. Antheræ flavæ obtusæ 4 lin. longæ filamentis paulo breviores. Pedicelli fructiferi erecti. Capsula oblonga 1 poll. longa profunde acute angulata. *Columbia britannica*, *Douglas!* *Oregon*, *Spalding!*

Subgenus III. *CYCLOBOTHTRA* (*Sweet*). *Bulbus* fibroso-tunicatus. *Folia* in axillis bulbilifera. *Sepala* facie maculata et interdum pilosa. *Petala* facie leviter foveolata. *Capsula* cylindrico-triquetra. *Omnes mexicani*.

13. *C. HARTWEGII*, *Benth. Pl. Hartw.* 26.—*Cyclobothra Hartwegii*, *Kunth, Enum.* iv. 231. Bulbum non vidi. Caulis sesquipedalis flexuosus, foliis 5–6 ascenduntibus anguste linearibus glabris firmis canaliculatis  $1\frac{1}{2}$ –2 lin. latis axillis interdum bulbiliferis, infimis pedibus, supremis geminatis vel ternis 3–4 poll. longis. Flores 1–2. Perianthium 2 poll. longum flavidum purpureo suffusum, segmentis oblongo-lanceolatis, exterioribus acutioribus paulo brevioribus medio 4–4 lin. latis supra maculam suprabasalem pilis paucis instructis, interioribus 6 lin. latis dorso saturate purpurascensibus foveola obscura centrali et pilis sparsis late dispersis præditis. Filamenta 6–7 lin. longa. Antheræ obtusæ 3–4 lin. longæ. Ovarium 1 poll. longum cylindrico-triquetrum, stigmatibus parvis recurvato-patentibus. Capsula linearis triquetra 3 lin. crassa. *Mexico in pascuis*

*montosis ad Aguas Calientes, Hartweg, 230!* Ab speciebus omnibus generis reliquis recedit et ad *Fritillariam* accedit segmentis perianthii exterioribus subpetaloideis.

14. *C. PURPUREUS, Baker.*—*Fritillaria purpurea, H. B. K. Nov. Gen. i. 288.*—*Cyclobothra purpurea, Sweet, Flow. Gard. ser. ii. t. 20.*—*Calochortus Bouplandianus, Schult. fl. Syst. Veg. vii. 1532.*—*Cyclobothra propinqua, Schauer, Linn. xix. 701.* Bulbus ovoideus fibroso-tunicatus. Caulis 1-1½-pedalis, 1-2-cephalus, interdum profunde furcatus, foliis 5-6 firmis ascendentibus bulbillis magnis in axillis præditis, inferioribus linearibus 5-6 poll. longis, superioribus lanceolatis 1-2 poll. longis basi 3-4 lin. latis. Flores primum cernui, ad anthesin horizontales. Perianthium purpureum 9-12 lin. longum, segmentis exterioribus brevioribus oblongo-lanceolatis dorso viridibus facie glabris infra medium distincte maculatis, interioribus petaloideis oblongo-oblancoelatis subobtusis 3 lin. latis ad unguem obscure foveolatis per totam mediam pilis hispidis purpureo-flavis barbatis. Filamenta 3 lin. longa, antheris obtusis duplo brevioribus. Ovarium cylindrico-triquetrum 4-5 lin. longum, stigmatibus recurvato-patentibus. *Mexico, Graham! Galeotti, 5512! &c.*—*CYCLOBOTHA GRANDIFLORA, Mart. & Gal. Enum. p. 13; Kunth, Enum. iv. 698,* est forma grandiflora sepalis præsertim majoribus ad pollicem longitudine attingentibus. *Mexico, Galeotti, 5513!*—*CALOCHORTUS FUSCUS, Schult. fl. Syst. Veg. vii. 1534,* est verisimiliter forma hujus speciei sepalis facie leviter setosis.

15. *C. FLAVUS, Schult. fl. Syst. Veg. vii. 1533; Maund, Bot. iv. t. 170*—*Cyclobothra flava, Lindl. Bot. Reg. sub t. 1662.*—*Fritillaria barbata, H. B. K. Nov. Gen. i. p. 288, t. 677.*—*Cyclobothra barbata, Sweet, Flow. Gard. t. 273.*—*C. lutea, Lindl. Bot. Reg. t. 1663.*—*Calochortus pallidus, Schult. fl. Syst. Veg. vii. 1533.* Bulbus ovoideus fibris firmis reticulatis tunicatus. Caulis 1-6-cephalus 1-2-pedalis gracilis fragilis sæpe profunde furcatus ramis erecto-patentibus. Folia infra furcam 2-3 linearia longe acuminata 9-12 poll. longa; bractæe bulbillis parvis in axillis præditæ, inferiores lineares acuminatæ, superiores parvæ lanceolatæ subscariosæ. Perianthium primum nutans, flavum 8-10 lin. longum segmentis exterioribus paulo brevioribus ovatis acutis dorso viridibus facie flava macula obscura et setis paucis medio præditis, interioribus obovatis subobtusis vel cuspidatis petaloideis 4-6 lin. latis supra unguem foveola obscura et supra foveolam per totum medium setis purpurascensibus brevibus præditis. Filamenta 4 lin. longa, antheris luteis obtusis duplo brevioribus. Stylus triquetro-cylindricus 4½-5 lin. longus. *Mexico, Pavon! Hartweg, 404! Coulter, 1556-57! Bourgeau, 657!*

Subgenus IV. *MARIPOSA (Wood).* Bulbus membranaceo-tunicatus. Folia convoluta in axillis haud bulbillifera. Sepala

facie interdum maculata. *Petala* basi leviter foveolata. *Pedicelli* fructiferi erecti. *Capsula* lineari-triquetra obtuse angulata. *Stirps* floribus omnium speciosissimis, speciebus omnibus arcte affinis.

16. *C. LUTEUS*, *Dougl. MSS.*; *Lindl. Bot. Reg.* t. 1567; *Kunth, Enum.* iv. 233; *Pact. Mag.* i. t. 221; *Flore des Serres*, ii. t. 40; *Wood, Proc. Acad. Phil.* 1868, 169. Bulbus ovoideus membranaceo-tunicatus 6–9 lin. crassus. Caulis 1–1½-pedalis firmus flexuosus 1–4-cephalus. Folia 3–4 anguste linearia glauca canaliculata 6–12-pollicaria. Bracteæ foliaceæ lineares acuminatæ 1–2-pollicares. Sepala lanceolata acuta vel acuminata flavo-viridia 9–15 lin. longa, facie flavo-maculata nigro-punctata. *Petala* saturate aurantiaca obovato-cuneata truncata 12–18 lin. longa et lata, supra unguem foveola obscura dense barbata instructa, facie supra foveolam subcalvata sæpissime punctis brunneis zonata et ad medium maculata. *Antheræ* obtusæ 3–4½ lin. longæ filamentis aurantiacis paulo breviores. *Capsula* lanceolato-triquetra 12–21 lin. longa, 3–4 lin. lata, obtuse angulata. *California*, Douglas! Hartweg, 1983! Bigelow! Lobb, 244! &c.

Var. WEEDII.—*C. Weedii*, *Wood, Proc. Acad. Phil.* 1868, 169. *Petala* saturate aurantiaca, medio haud maculata, prorsus faciem totam barbata. *California*, Weed, Coulter, 731 ex parte!

17. *C. MACROCARPUS*, *Dougl. Hort. Trans.* vii. 276, t. 8; *Lindl. Bot. Reg.* t. 1152; *Schult. fl. Syst.* vii. 1530; *Kunth, Enum.* iv. 232; *Wood, Proc. Acad. Phil.* 1868, 169. Bulbus ovoideus membranaceo-tunicatus 9–15 lin. crassus. Caulis firmus flexuosus 1½–2-pedalis 2–6-cephalus. Folia 3–4 anguste linearia convoluta, inferiora 6–9-pollicaria. Bracteæ firmæ convolutæ 1–4-pollicares. Sepala lanceolata viridia immaculata 15–24 lin. longa margine late scarioso. *Petala* sepalis subæquilongâ saturate lilacina obovata distincte cuspidata, medio immaculata, ungue pilis paucis circa foveolam obscuram barbatam prædito. *Antheræ* subobtusæ 5–6 lin. longæ filamentis lilacinis æquilongæ. *Capsula* lineari-triquetra, 2–3 poll. longa, 3–4 lin. crassa, obtuse angulata. *Columbia britannica*, Douglas! Lyall! Geyer, 618! Adest forma petalis rubellis.

18. *C. SPLENDENS*, *Doug. MSS.*; *Benth. Hort. Trans.* n. s. i. 411, t. 15. fig. 1; *Lindl. Bot. Reg.* t. 1676; *Kunth, Enum.* iv. 232; *Wood, Proc. Phil. Acad.* 1868, 169. Bulbus ovoideus membranaceo-tunicatus. Caulis flexuosus 1½–2-pedalis 3–5-cephalus. Folia 3–4 anguste linearia convoluta 6–9-pollicaria. Bracteæ lineares acuminatæ 2–3-pollicares. Sepala lanceolata viridia immaculata 12–18 lin. longa. *Petala* saturate lilacina obovato-cuneata 18–24 lin. longa et lata extrorsum rotundata vel leviter cuspidata, medio concoloria vel interdum rubello maculata, tertio inferiore pilis purpureis circa foveolam barbatam prædito. *Antheræ* subacutæ 5–6 lin. longæ,

- filamentis subæquilongæ. Capsula lineari-triquetra  $1\frac{1}{2}$ –2-pollicaris 3–4 lin. crassa. *California*, Douglas! Lobb! Coulter, 731–32!
19. *C. VENUSTUS*, *Benth. Hort. Trans.* n. s. i. 412, t. 15. fig. 3; *Lindl. Bot. Reg.* t. 1669; *Kunth, Enum.* iv. 233; *Maund, Bot.* i. t. 30; *Past. Mag.* i. t. 175; *Flore des Serres*, ii. t. 40; *Wood, Proc. Acad. Phil.* 1868, 169. Bulbus ovoideus membranaceo-tunicatus 6–9 lin. crassus. Caulis flexuosus 1–2-pedalis 2–6-cephalus. Folia 3–4 anguste linearia convoluta. Bracteæ lineares foliaceæ 2–4-pollicares. Sepala lanceolata 12–18 lin. longa, facie interdum distincte maculata. Petala late obovato-cuneata extrorsum rotundata albida vel pallide lilacina, medio concoloria vel aurantiaco-purpureo maculata, ungue foveola obscura barbata prædita et supra foveolam punctis rubro-brunneis et pilis paucis instructo. Antheræ obtusæ 3 lin. longæ filamentis paulo breviores. Capsula lineari-triquetra 15–18 lin. longa, 3–4 lin. crassa, leviter angulata. *California*, Douglas! Jeffray, 1276! Bigelow! Coulter, 733! Hartweg, 1983! &c.
- Var. *CITRINUS*, *Baker*. Petala citrina, macula centrali rubro-brunnea ad apicem aurantiaca. *California*, Bridges, 284! &c. Ab typo ad *C. luteum* recedit.
20. *C. GUNNISONI*, *S. Wats. Bot.* 40 *Parall.* 348; *Regel, Enum. Descrip. Plant. Nov.* 1873, 21. Bulbus ovoideus membranaceo-tunicatus. Caulis firmus 1– $1\frac{1}{2}$ -pedalis 1–4-cephalus. Folia 3–4 anguste linearia canaliculata, inferiora 6–9 poll. longa. Bracteæ lineares foliaceæ. Sepala lanceolata acuminata 12–15 lin. longa viridia facie vix maculata. Petala obovato-cuneata, 15–18 lin. longa et lata, extrorsum rotundata vel leviter cuspidata, pallide lilacina vel albida medio immaculata, tertio inferiore lilacino saturatiore zonata, dense pilosa et foveola barbata prædita. Antheræ acutæ 3–4 lin. longæ, filamentis subæquilongæ. Ovarium cylindrico-triquetrum. *Montes Scopulosi Americæ borealis (Colorado, Utah)*, Geyer, 68! 609! Burke! Gunnison.
21. *C. LEICHTLINII*, *Hook. fil. Bot. Mag.* t. 5862. Bulbus parvus ovoideus membranaceo-tunicatus. Caulis 5–6-pollicaris gracilis flexuosus 1–3-cephalus. Folia 3–4 anguste linearia convoluta  $1\frac{1}{2}$  lin. lata. Bracteæ foliaceæ 1–2-pollicares. Sepala lanceolata viridia 12–15 lin. longa. Petala obovato-cuneata 18–21 lin. longa et lata extrorsum leviter cuspidata alba, ungue macula purpurea supra et pilis paucis circa foveolam obscuram prædita. Antheræ flavæ obtusæ 3 lin. longæ filamentis paulo breviores. Ovarium cylindrico-triquetrum. *California ad montes Sierra Nevada*, Roehl in Hort. Leichtlin. ! (v. v. in Hort. Kew.).