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ON THE GROUPING OF SPECIES IN GENERA OF LORANTHEAE WITH DISEPALOUS CALYX AND VERSATILE OR STRUTHANTHOID ANTHERS

by

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In two previous Notes (1), I showed how it is appropriate to group into genera the numerous species of the Lorantheae tribe which, having the dialysepalous calyx and the basifixed anthers, make up the sub-tribe of the Phenicanthemeae and which all inhabit the various parts of the old world. I had to do a similar work for the species of the same tribe which, having the dialysepalous calyx and the versatile anthers, form the sub-tribe of Struthantheae and which almost all live in America. It is a summary of this work that I present to the Society today.

According to the mode of inflorescence, the species in question fall into three categories. In the first, the inflorescence is simple and each flower offers at its base only a single bract, concrescent, as we know, with the pedicel when there is one.

In the second, the inflorescence is still simple, but each flower bears at its base three bracts, namely: the mother bract, concrescent with the pedicel, and two lateral secondary bracts or bracteoles.

In the third, finally, the inflorescence is composed of triads, because the two bracteoles each produced a flower in its axil.

In each category, the species are grouped into several genera, which must first be distinguished and characterized in a few words.

Species with a single inflorescence and flowers with a single bract form five genera. Some have pentameric flowers arranged in a terminal raceme, sometimes spike-like: this is the new genus *Metastachys*. In others, the inflorescence is a terminal umbel of pentameric flowers, usually bifloral: this is the new genus *Furcilla*. Others have the hexameric flowers, arranged in a spike ending in a short leafy branch, the base of which is surrounded by a cortical sheath: this is the new genus *Cladocolea*. In others, the inflorescence is an axillary umbel of hexameric flowers: this is the new genus *Martiella*. Finally, others have the hexameric flowers grouped in an axillary spike and nestled in as many hollowed out cells in the thickened axis: this is the genus *Oryctina*.

Species with a single inflorescence and flowers with three bracts make up four genera. Some have the flowers arranged in a terminal raceme with three free bracts and all the stamens similar: this is the genus *Tristerix* of Martius. In others, the inflorescence is an axillary raceme, with three concrescent bracts, and stamens of two kinds, some short and fertile, the other long and sterile, with a thread excavated on each side like a violin by the pressure of the broad anthers of short stamens: this is the genus *Dendropemon* of Blume. Others have the flowers grouped in an axillary spike, nested in as many alveoli hollowed out in the thickened axis, and the three bracts are free: this is the genus *Oryctanthus* of Eichler. In others, finally, the flower is solitary in the axil of the leaf, sessile and provided at its base with three free bracts: this is the genus *Phthirusa* of Martius.

Finally, the many species where the inflorescence is composed of triads form ten genera. In some, the flowers, sessile in each triad and with concrescent bracts, have stamens of two kinds, regularly alternating, as in the *Dendropemon*; is the genus *Passowia* of Karsten. Others have the flowers constantly unisexual with dioecy and the stamens are quite similar: if the triads have their three sessile flowers with concrescent bracts, it is the genus *Struthanthus* of Martius, sensu stricto; if they have their three sessile flowers with free and caducous bracts, with a spirally twisted style in the female flower and with an accrescent pedicel under the fruit, it is the genus *Spirostylis* of Presl; if they have their three pedicellate flowers with free and deciduous bracts, it is the new genus *Eichlerina*. In others, the flowers are hermaphrodite, all three sessile in each triad with deciduous bracts, as in the *Spirostylis*, but with a straight style and non-accrescent pedicel; in addition, the axillary spike has its base surrounded by a collar of persistent bracts: this is the new genera *Peristethium*. Others have the flowers also hermaphrodite arranged in a row of triads with sessile median flower, with pedicellate lateral flowers; if the raceme is terminal with pentameric flowers, it is the recently established genus *Mullerina*; if it is terminal with hexameric flowers, with abortion of the median flower of each triad and, on the other hand, development of the mother bract into a vegetative leaf, it is the new genus *Dipodophyllum*; if it is axillary, with developed median flower and scaly mother bract, it is the restricted genus *Phrygilanthus* of Eichler. In others, finally the flowers, always hermaphrodite, are pedicellate all three in each triad and the bracts are caducous there; if the flowers are hexameric, it is the new genus *Tripodanthus*; if they are tetrameric, it is the recently established genus *Hookerella*.

Let us now take again one by one the nineteen genera thus briefly defined, in order to study their characters and their constitution a little more closely.

I. - GENERA WITH SIMPLE INFLORESCENCE, PROVIDED WITH A SINGLE SUBFLORAL BRACT.

1. On the new genus METASTACHYS (Bentham and Hooker). - The link which unites the species of this genus was noticed, as early as 1830, by A. P. de Candolle, who grouped them in a subdivision of the genus *Loranthus* under the name of *Oscillaritherae pentamerae* (2). Unknown by Eichler who in 1866 united them with other very different species in the *Quintralia* section of its genus *Phrygilanthus* (3), it was reestablished in 1883 by Bentham and Hooker, who made it, under the name of *Metastachys*, a subsection of section *Phrygilanthus* of the genus *Loranthus* (4). This group was maintained and erected as a section in 1889 by M. Engler, who admits the autonomy of the genus *Phrygilanthus* (5). In our opinion, it should henceforth constitute, under the same name, a distinct genus.

Indeed, the species which compose it do not resemble each other only, as it has been said, by their terminal raceme, by the pentamery and the large size of their flowers, they also have in common several other distinctive characters; we can only point out here one of the most striking. The inferior ovary, since the outer wall contains a few isodiametric sclerotic cells, has a thick, deep, lignified cup shaped like a conical drinking glass. The pistil consists of five alternisepalous carpels; there is no abortion. Above the departure of the caliculus and the calyx, it prolongs its ovary in a kind of pentagonal dome surmounted by the style. This first persists for some time, then falls, leaving the pyramidal swelling which bears it adhering to the fruit. In short, the ovary here is only partially inferior. In some species, the free upper region is almost equal to the concrescent lower part and the ovary is only semi-inferior. This remarkable arrangement has already been observed, as we remember, in the Elytrantheae tribe, where it characterizes in

particular the New Caledonian genus *Aciella*. We find it here, with the same characters, in a completely different group.

If we provisionally adopt the synonymy established by Eichler, the genus *Metastachys*, thus defined, takes only four species, which can be grouped into two sections: the first, *Eumetastachys*, where the bracts are small and scaly, contains *M. grandiflora* (*Loranthus grandiflorus* Ruiz and Pavon), *M. secunda* (*L. secundus* Bentham), and *M. verticillata* (*L. verticillata*) Ruiz and Pavon); the second, *Stachyphyllum*, where the bracts are large and leafy, is reduced to only *M. corymbosa* (*L. corymbosus* Dietrich).

The study of Loranthoideae collected by Lehmann in Colombia, in 1883, allowed me to add two new species to the previous four.

By its scaly bracts, the first (Lehmann, n° 2383) is attached to the section *Eumetastachys*, and by the size of its flowers, which are about 10 centimeters in length, it resembles *M. secunda*. It differs from it in particular by the conformation of the terminal spike-like raceme, where the pedicels are very short, so that this raceme is almost a spike, and where the flowers, consequently, are not rejected on only one side; it also differs from it by the greater development of the upper part of the ovary, which forms a dome with five ridges, so that the ovary is only semi-inferior: I will name it *M. tholifera* (6). It still offers this interesting character of not being parasitic; the label bears, in fact, that it is “a shrub with weak branching, spread out, inhabiting the sparse forests of the mountains on the upper slopes of the Alto de Oteras, at 3000 meters high, near Tolima (Colombia)”.

By its leafy bracts, the second (Lehmann, n° 3172) is part of the section *Stachyphyllum*.

It differs from *M. corymbosa* by its larger leaves and by its flowers whose stamens have a net bristling with small teeth on the edges: I will name it *M. denticulata*. It is parasitic on various kinds of trees towards the upper limit of the forests, on the eastern slope of the Paramo de Ruiz, between 3500 and 3800 meters, in the state of Cauca (Colombia).

Currently made up of these six species, the genus *Metastachys* is widespread in the Andes, from Chile to Colombia.

2. On the new genus FURCILLA. - Defined, as it was said above, by its inflorescence in terminal bifloral umbel, of which the primary pedicel and the secondary pedicels are very slender and form, at the top of the branches, a very delicate and very fragile fork, the genus *Furcilla* (7) has narrow, pentameric flowers. It includes, as we know (8), two species, namely: *Furcilla myrtifolia* (*Loranthus myrtifolius* A. Cunningham) and *F. Bidwillii* (*L. Bidwillii* Bentham), both inhabiting Australia.

3. On the new genus CLADOCOLEA. The type of this genus is the plant collected in Mexico by Andrieux in 1883 and distributed under the number 345.

The leaves are there isolated on the twigs, which are marked with corresponding ribs; they are small, attenuated in a petiole, at the base, rounded at the top, perminerves with veins visible especially on the underside. In the leaf axils, the bud is first covered by a thick cortical layer over which the periderm extends. When it develops, this pouch opens through a transverse slit and the twig now has its base surrounded by a bivalve sheath, the upper valve pressed against the branch, the lower against the leaf. After its fall, this sheath persists in the form of a well at each node. This remarkable arrangement has already been pointed out twice in the Loranthoids, first, in the Lorantheae of the Phenanthemy sub-tribe, in the Coleobotrys, then in the Elytranthae of the Treubellar sub-tribe, in the Peraxilla. We find her here in a completely different group. It is from

this that we derive the name of *Cladocolea* (1) for this genus and the species will be *Cl. Andrieuxii*.

The branch thus formed produces at first two or three ordinary leaves, then ends in a short spike bearing seven to nine flowers on as many protuberances, each provided with a rudimentary bract. These flowers are hermaphrodite, hexameric and very small, not exceeding five millimeters. The calix is poorly developed and the stamens are concrescent to the sepals throughout their length, so that the anthers are sessile. The inferior ovary, devoid of sclerotic cells in its outer wall, has a small, lignified, log-shaped cup about a quarter of its length; the pistil is reduced to three carpels, by abortion of the other three, and forms, around the base of the style, a large hexagonal bead. It follows that after the fall of the style, the ovary offers at the top an umbilicus and not a dome, as in the *Metastachys*.

To the type species thus characterized, it is appropriate to add, in the same genus, the *Loranthus tehuacanensis*, *Grahami* and *OErstedii*, the first two collected in Mexico by Liebmann in 1842, the third in Nicaragua by OErsted in 1846. These three species have been described by M. Oliver (2) and related by him to the *Oryctanthus* section of the genus *Loranthus*. The absence of secondary bracts, the size of the flowers and their non-immersion in the axis of the spike, together with other characters, set them far away from *Oryctanthus*. Their place seems to be in the genus *Cladocolea*, but they must constitute a special section there.

The spike, in fact, is not terminal there, but axillary; in other words, the flowering branch does not bear leaves under the flowers. It is nonetheless enveloped in a pocket in the state of a bud and later in a basilar sheath. If there are two or three spikes close together in the same axilla, as is common in *Cl. Tehuacanensis*, they are first housed in the same pouch and later surrounded by the same sheath.

As we have already seen for the genera *Loranthus*, *Chiridium*, *Coleobotrys*, *Stemmatophyllum*, etc., the genus *Cladocolea* therefore comprises two sections: the first, *Eucladocolea*, where the spike ends a leafy branch, has so far been reduced to *Cl Andrieuxii*; the second, which can be called *Stachycolea*, where the spike is axillary, includes *Cl. tehuacanensis*, *Grahami* and *OErstedii*. It may also be necessary to link to this *L. diversifolius* Bentham, which Mr. Oliver says is a neighbor of *Cl. Oerstedii*, but which I have not yet been able to study.

The branch thus formed produces at first two or three ordinary leaves, then ends in a short spike bearing seven to nine flowers on as many protuberances, each provided with a rudimentary bract. These flowers are hermaphrodite, hexameric and very small, not exceeding five millimeters. The calicle is poorly developed and the stamens are concrescent to the sepals throughout their length, so that the anthers are sessile. The inferior ovary, devoid of sclerotic cells in its outer wall, has a small, lignified, log-shaped cup about a quarter of its length; the pistil is reduced to three carpels, by abortion of the other three, and forms, around the base of the style, a large hexagonal bead. It follows that after the fall of the style, the ovary offers at the top an umbilicus and not a dome, as in the *Metastachys*.

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4. On the new genus MARTIELLA. - The type of this genus is *Loranthus Palmeri* Watson, which is also from Mexico (Pringle, No. 3858), where it grows as a parasite on *Bursera*.

The leaves, isolated and wedge-shaped, have at their axils a primary pedicel bearing, on its slightly swollen top, six to eight secondary pedicels, terminated by as many rather large hexameric flowers, measuring 35 millimeters, each having at its base a single bract. The inferior ovary, devoid of sclerotic cells in its outer wall, has a thick, deep, lignified cup shaped like a drinking glass. The pistil is complete, formed of six alternisepalous carpels; it extends its ovary a little above the start of the calyx, so that the style is worn at the top of a bulge and devoid of a bulge.

By this structure of the flower, this plant resembles the *Metastachys*; by the inflorescence in an axillary umbel, by the hexamery of the flower, and by several other characters, it differs sufficiently from it to be necessary to distinguish it generically. This new genus will bear the name of *Martiella*, in honor of Ph. De Martius who, in 1830, inaugurated the grouping of American *Loranthus* into distinct genera. The species in question will therefore be *Martiella Palmeri* (Watson).

5. On the new genus ORYCTINA. - This genus has as a type, until now unique, Eichler's *Oryctanthus scabridus* (1), which grows in Brazil. Resembling *Oryctanthus* by the inflorescence in an axillary spike, by the smallness of the flowers, their immersion in the honeycomb axis of the spike and their hexamery, this species differs by the habit, the absence of bracteoles and dioecy. So Eichler, in describing it, suggested that it may be a generic type, distinct from *Oryctanthus*.

To recall that the flowers are also nested there in as many dimples dug in the axis of the spike, we will name this genus *Oryctina* (1) and the type species will become *Oryctina scabrida* (Eichler).

II. - GENERA WITH SINGLE INFLORESCENCE, PROVIDED WITH THREE SUB-FLORAL BRACTS.

6. On the genus TRISTERIX Martius. - As early as 1830, *Loranthus tetrandrus* Ruiz et Pavon and *L. aphyllus* Miers, which grow in Chile and Peru, were united by A.P. de Candolle, under the name *Oscillantherae tetramerae*, in a special subdivision of the genus *Loranthus* (13) . The same year, Martius created for the first species his genus *Tristerix* (14), by wrongly

including two very different species, which Blume was quick to remove to transfer them to his genus *Macrosolen* (15).

This genus has not been admitted since. By its three free sub-floral bracts and by its tetramery, it is however very clearly characterized compared to the *Metastachys*, of which it shares the inflorescence in a terminal simple raceme. It is therefore necessary to restore it. It remains until now reduced to its two primitive species.

7. On the genus DENDROPEMON. - Blume established this genus in 1830 (16), for a certain number of species growing in the Antilles, which A. P. de Candolle had grouped with many others in his section of *Protostelides*. This genus has not been accepted as such; Eichler made it a section of his genus *Phthirusa* and Bentham and Hooker a subsection of their section *Struthanthus*. Its inflorescence in a simple axillary raceme, its hexameric flowers with three concrescent sub-floral bracts and especially its dimorphic stamens characterize it very well. It is to be restored.

It first includes ten species previously described, namely: *Dendropemon parvifolius* (Sw.), *uniflorus* (Jacq.), *emarginatus*: (Sw.), *pauciflorus* (Sw.), *psilobotrys* (DC.), *portoricensis* (DC.), *cubensis* (Gris.), *laxiflorus* (Desv.), *domingensis* (Desv.). Then, I recently attached to it the *Triarthron loranthoideum* Baillon, which became the *D. loranthoideus* (Baillon) (17), and I can now add a new species, collected by Jacquemont in Saint-Domingue in 1827, remarkable for the flattening wing of the peduncle of the bunch and which I will call *D. alatus*. It is interesting to note that all the species of this genus are limited to the Antilles and that none grows on the American continent.

As *D. uniflorus* (Jacq.) is distinguished from others by its sessile anthers, Blume has made it the type of a genus, under the name of *Lipotactes* (18). But this difference, which is frequently found elsewhere between species of the same genus, appears too small for it to be necessary to maintain this genus.

8. On the genus ORYCTANTHUS (Grisebach) Eichler. - First distinguished as a section of the genus *Loranthus* by Grisebach in 1860 (19) and adopted in this sense by Bentham and Hooker in 1883 (20), this group was established as a genus by Eichler in 1866 (21) and admitted as such by M. Engler in 1889 (22). By its flowers nested in as many alveoli hollowed out in the thickened axis of the spike, it is immediately distinguished from other tribracteal genera, just as, by its three sub-floral bracts, it clearly separates from the genus *Oryctina*, established above.

It includes at least seven species, namely *O. amplexicaulis* (HBK), *occidentalis* (L.), *glaberrimus* (Oliv.), *botryostachys* Eich., *spicatus* (Jacq.), *ruficaulis* (Pöpp.), *chloranthus* (Miq.), widespread in tropical America.

9. On the genus PHTHIRUSA Martius. - AP de Candolle had already considered Martius' *Loranthus clandestinus* as the type of a subsection of the genus *Loranthus*, which he called *Clandestini* (23), when Martius established for this species his genus *Phthirusa* (24), immediately admitted by Blume (25). Later, Eichler gave this generation a very large extension by admitting not only the *Dendropemon*, but also a large number of species where the inflorescence is composed of triads and which are attached to the genus *Passowia*, distinguished previously by Karsten, as we will see later. This genus has thus become very heterogeneous (26). Bentham and Hooker therefore thought it necessary to derive the restricted meaning given to it

by Martius from *Phthirusa* and to consider them, like *Passowia* and *Dendropemon*, as three equivalent subsections of their *Struthanthus* section of the genus *Loranthus* (27).

In accordance with this opinion, we believe that the *Phthirusa* genus should be restored to its original meaning. By its solitary flowers, it stands out clearly from all other tribracteolate genera, at the same time as, by its three sub-floral bracts and by its all similar stamens, it; moves away from the *Passowia*. So far, it only includes a very small number of species, which inhabit tropical America, especially Brazil.

III. – GENERA WITH INFLORESCENCES COMPOSED OF TRIADS

10. On the genus PASSOWIA Karsten. - Karsten established this genus in 1852 (28) for his *P. odorata*, which appears to be identical to *Loranthus Theobromae* Willdenow. We have just seen that the group of which this species is the type was included by Eichler in the *Euphthirusa* section of its genus *Phthirusa*, while Bentham and Hooker later gave it back its autonomy, at least as a subsection. In our opinion, it should be reestablished as a separate genus.

Its inflorescence composed of triads separates it, in fact, from all the genera which we have just studied and the dimorphism of its stamens, at the same time that it brings it closer to the *Dendropemon*, clearly distinguishes it from all the genera which it has just studied. we still have to consider. Thus defined, it includes about twenty species, most of them hexameric: *P. magdalenae* (Ch. And Schl.), *Virgata* (Mart.), *theobromae* (Willd.), *polystachya* (Eichl.), *erythrocarpa* (Mart.), *nitens* (Mart.), *theloneura* (Eichl.), *stenophylla* (Eichl.), *orinocensis* (Spreng.), *ovata* (Pohl), *rufa* (Mart.), *squamulosa* (Kl.), *pycnostachya* (Eichl.), *pirifolia* (HBK), *myrsinites* (Eichl.), *alternifolia* (Eichl.), some tetramers: *P. santaremensis* (Eichl.), *guyanensis* (Kl.), *phaeoclados* (Eichl.), *janeirensis* (Eichl.), *micrantha* (Eichl.), all inhabiting tropical America, especially Brazil.

11. On the genus STRUTHANTHUS Martius, part. - Founded by Martius in 1830, admitted immediately by Blume and later by Eichler, reduced by Bentham and Hooker to the section of *Loranthus*, recently reestablished as such by Mr. Engler, the genus *Struthanthus* must, without doubt, be preserved. But, in our opinion, it is necessary to restrict it to species with concrescent and persistent bracts, separating from them those which have free and deciduous bracts, and which in turn constitute three distinct genera: *Spirostylis*, *Eichlerina* and *Peristethium*, which we will study later.

Reduced in this way, this genus still includes about thirty species. All have the three sessile flowers in each triad, which is a capitulum; but they may be grouped into three sections, according as the inflorescence therein is a raceme, a spike, or a head of triads. The first, *Eustruthanthus*, where the inflorescence is a raceme of triads, includes *Str. polyrrhizus* Mart., *flexicaulis* Mart., *attenuatatus* (Pohl), *staphylinus* Mart., *tetraquetrus* Mart., *cuspidatus* Mart., *terniflorus* (Willd.), *dichotrianthus* Eichl., *phyllireoides* (Willd.), *nigricans* Eichl., *marginatus* (Desr.) , *polyanthus* Mart., *syringifolius* Mart., *calobotrys* Eichl., *Salzmanni* Eichl., etc. The second, *Struthiostachys*, where the inflorescence is a spike of triads, contains *Str. salicifolius* Mart., *rubens* Mart., *radicans* (Ch. and Schl.), *concinnus* Mart., *pterygopus* Mart., etc. The third, *Struthiocephalus*, where the inflorescence is a head of triads, contains *Str. c*onfertus Mart., *taubatensis* Eichl., *glomeruliflorus* Eichl., etc. The flowers are everywhere hexameric, with the

exception of *Str. salicifolius*, which has them tetramers. All of them inhabit the tropical zone of the American continent.

12. On the genus SPIROSTYLIS - Presl established the genus *Spirostylis* for a Loranthoideae collected by Haenke in Peru, which he named *Sp. Haenkei*, and which Schultes described in 1829 (29). The flowers are grouped there in an axillary raceme of triads, sessile in each triad, which is a capitulum, with free bracts and very early deciduous. They are unisexual with dioecy. In the female flower, the style, straight in its lower part, is twisted on itself, curled up in its upper region and swelled at the stigma at the top, an arrangement very similar to that which characterizes the *Ileostylis*, in the sub-tribe of the *Phenanthémées*. In the male flower, it is reduced to its lower right region and ends in a point. This curling of style, regarded by Presl, by Schultes, and soon after by Blume, as a generic character, appeared insufficient to A.P. de Candolle, who brought the plant back into the genus *Loranthus*, under the name *Lor. Spirostylis*, as well as to all the authors who followed and who understood this species among the *Struthanthus*.

On the other hand, Mr. Oliver described in 1864, under the names of *Loranthus chordocladus* and *L. crassipes*, two species which he also relates to his section *Struthanthus*, first collected in Nicaragua and Costa Rica by Oersted, the second in Mexico by Liebmann (30). The flowers are arranged there in briefly pedicellate triads, with sessile flowers and deciduous bracts, as in the Presl plant. The author does not say anything about the style, but he notices that, during the ripening of the fruits, the pedicel of the triad elongates and thickens, becoming fleshy and curving downwards.

By studying numerous samples of *L. crassipes* and several related species, I have been able to ensure that there is always a correlation between these two phenomena: the coiling of the style of the female flower, such as it has was observed first by Presl, and accrescence, i.e. the subsequent elongation with thickening and often downward curvature of the fruiting pedicel, as was later reported by Mr. Oliver . The examination that I was able to make of the type plant of Presl, showing me that the fruiting pedicel is also increasing in length and width, a circumstance that this botanist did not mention in his description, confirmed to me in this conviction.

The second character is therefore added to the first and both together to the independence and the lapsing of the bracts, so that the sum of differences thus obtained is largely sufficient not only to authorize, but also to require the final adoption of the genus *Spirostylis* of Presl. It should also be added that, in these plants, the axis of the raceme is surrounded at its base by a cortical sheath, the remainder of the pocket which enveloped it in the state of a bud, an arrangement similar to that of *Cladocolea*.

Thus defined, this genus includes first *Sp. Haenkei* Presl, then *Sp. quercicola* (Ch. and Schl.), *crassipes* (Oliver), *chordocladus* (Oliver), *cansjeraefolius* (Oliver) and a few other species, all originating from Mexico and neighboring countries. We must still very probably associate the *Loranthus interruptus* H. B. K., also originating in Mexico, in which Kunth pointed out for the first time, in 1818, the singular circumvention of the style (31).

13. On the new genus EICHLERINA. - Eichler brought together, in a special subdivision of his genus *Struthanthus*, a certain number of species where the triads, arranged in a raceme, have their three flowers more or less long pedicellate, with independent and quickly deciduous bracts (32). Later, Bentham and Hooker gave part of this subdivision the name of *Cymularia* (33).

In these plants the flowers are still unisexual with dioecy, but the female flower has an upright style and the triad pedicel is not accented. In this way, this group of species is distinguished on the one hand from *Struthanthus* and on the other from *Spirostylis*, and must constitute, alongside them, a distinct genus. I will name it *Eichlerina*, in memory of Eichler, the eminent botanist from Berlin who, in dealing with the Loranthaceae of Flora brasiliensis, greatly advanced our knowledge about this family.

Thus defined, the genus Eichlerina includes *E. vulgaris* (Mart.) *Rhynchophyllus* (Eichl.), *elegans* (Mart.), *orbicularis* (HBK), *densiflorus* (Benth.), *deppeanus* (Ch. and Schl.), *liebmanni* (Oliv.) and several other species, all inhabiting tropical America.

14. On the new genus PERISTETHIUM. - The type of this genus is *Loranthus leptostachyus* of Humboldt, Bonpland and Kunth, native to Peru and New Grenada. This species is regarded by Eichler, who seems not to have studied it, as a *Struthanthus* probably belonging to the group of *Str. crassipes* (34). It would then be, as we have just seen, a *Spirostylis*. It is not so. The inflorescence is also a spike of triads, and in each triad the hexameric flowers are also all sessile with free and deciduous bracts; but the flowers are hermaphroditic there, the style is straight and it does not form under the fruit of the fruit of the pedicel accrescent and fleshy.

By hermaphroditism and stamens of one kind, this species is already distinguished from all those of the preceding genera. But, in addition, it offers something very special.

As a bud, the spike is enveloped in a perula, formed of at least four crossed pairs of large white bracts. After its development, its axis therefore remains surrounded at the base by a cuff, which persists in the axil of the leaf after it has fallen. If there are, as usual, three and even five spikes side by side in the axil of the same leaf, each of them has its particular collar. This arrangement is completely reminiscent of that which characterizes, as we have seen, on the one hand the *Loranthus*, on the other the *Chiridium*, in the sub-tribe of the *Phenanthémées*.

For this genus, we will derive the name *Peristethium* (35), and the type species will be *P. leptostachyum* (H. B. K.).

15. On the new genus MULLERINA. - Characterized, as it has been said (36), by its inflorescence in a terminal raceme composed of triads with hermaphrodite and pentameric flowers, where the median is sessile and the lateral pedicellate, in a word which are cymules, the genus *Mullerina* is composed , as we have seen, of three species, namely: two from eastern Australia [*M. celastroides* (Sieber) and *eucalyptifolius* (Sieber)], and the third from New Zealand (*M. Raoulii*).

Its differences from all previous generations are so clear that it is useless to dwell on them.

16. On the new genus DIPODOPHYLLUM. - From a recent trip to Baja California, Mr. Diguet brought back to the Museum a Loranthoideae of the greatest interest. This plant, which grows as a parasite on *Fouquiera*, in particular on *F. floribunda*, as well as on a *Bursera* that the natives call Torole, differs, in fact, from all the American Loranthaceae currently known by its leaves, which are narrow, long and cylindrical.

We already know, it is true, several Loranthoids with cylindrical leaves, but they all inhabit Australia. We also know, from recent work (37), that they belong to different genera and even to different tribes of this subfamily. So while most *Amyema*, of the Loranthae tribe, have flat leaves, *A. linophylla*, *Preissii*, *gibberulosa*, etc., have cylindrical leaves. Likewise the *Lysiana*, of the Elytrantheae tribe, alongside species with flat leaves, have species with cylindrical leaves (*L.*

casuarinae, *linearifolia*, etc.). All these Loranthoids with cylindrical leaves inhabiting Australia, we could have seen in this character only one of the many plant peculiarities peculiar to this region. The plant of M. Diguet comes today to give us the proof that this form of leaves is also represented in America and that it is in a very different kind from those which have it in Australia, since it is here of a Struthantheae. Let us leave aside all the structural characteristics and limit ourselves to briefly characterizing this genus by its inflorescence.

The flowers are arranged there in a loose terminal raceme, each pedicel of which bears at the top, at the bottom the concrescent mother bract and on each side a secondary pedicel terminated by a hexameric flower, under which lies laterally the concrescent mother bract of this secondary pedicel. But here the mother bract of the primary pedicel has the same glaucous green color, the same cylindrical shape and almost the same length as the vegetative leaf. Below it, the pedicel, also having the same color, same shape and same diameter, seems to continue it until insertion on the stem. This results in the appearance of a vegetative leaf attached directly to the stem and carrying, at a point on its upper surface, two flower pedicels diverging in the shape of a V or a fork. The mother bracts of the pedicels, on the contrary, have the ordinary scaly form.

It is, without a doubt, this development into a green leaf and assimilating the mother bract of the primary pedicel which explains, by a nutritive balancing, the complete abortion of the terminal flower of this pedicel, placed immediately above it; so that the inflorescence of this plant must be considered as being a terminal raceme, composed of triads with a sessile median flower, with pedicellate lateral flowers, in a word a terminal raceme of cymules. But here, and this is one of the characteristics peculiar to this genus, there are constantly produced in the cymule two simultaneous and correlative phenomena, namely: the development of the mother bract concrescent into a vegetative leaf and the total abortion of the superimposed terminal flower.

To express this character, to say with a single word that here each heterogeneous triad carried at the end of a primary pedicel consists of a leaf and two secondary pedicels, we will name this genus *Dipodophyllum* (38), and the species in question will be *D. Digueti*.

We must expect that new trips to this region, still so little explored, will introduce us to other *Dipodophyllum*, which may very well have flat leaves and more or less large with leafy bracts of the same shape, as we saw above that it is the case for *Amyema* and *Lysiana* of Australia.

17. On the genus PHRYGILANTHUS Eichler, part. - By establishing his genus *Phrygilanthus* in 1866, Eichler brought together very dissimilar species, which immediately led him to subdivide it into three sub-genera: *Quintralia*, *Taguana* and *Tripodanthus* (39). The first is still very heterogeneous; it contains the species that we have classified above in the genus *Metastachys*, those that we have placed in the genus *Tristerix* and finally the *Loranthus cuneifolius* Ruiz and Pavon, which must be withdrawn from the tribe of the Lorantheae and incorporated, as is will see later, in that of the Psittacantheae. This sub-genus therefore disappears completely as such.

The third is, on the contrary, very homogeneous and comprises a series of species which differ sufficiently from the others for it to be necessary to separate them from them and to make a distinct genus of them, as will be said later.

Finally, the second is, in turn, very heterogeneous. It includes, in fact, first of all the Australian species which have been ranked above in the two genera *Furcilla* and *Mullerina*, then several species with plurilocular ovary and drupaceous fruit that must be removed from the Lorantheae tribe for the incorporate, as will be seen later, with that of Gaiadendreae (*Loranthus*

tagua R. and P., *punctatus* HBK, *puracensis* HBK, *mutabilis* Poep. and Endl., etc.). These various eliminations made, only a small number of species remain of this second subgenus to constitute the genus *Phrygilanthus* in its new meaning. These are, in particular, the *Ph. heterophyllus* (R. and P.) and *berteroi* (Hook. and Arn.), which grow in Chile and Peru.

Thus restricted, this genus is defined, if we leave aside all the structural characters, by its inflorescence in an axillary raceme of triads with hexameric flowers, the sessile median, the lateral pedicellates, in a word of cymules. In this way, it shows itself to be a neighbor of the genus *Dipodophyllum*, from which it is nevertheless very clearly distinguished.

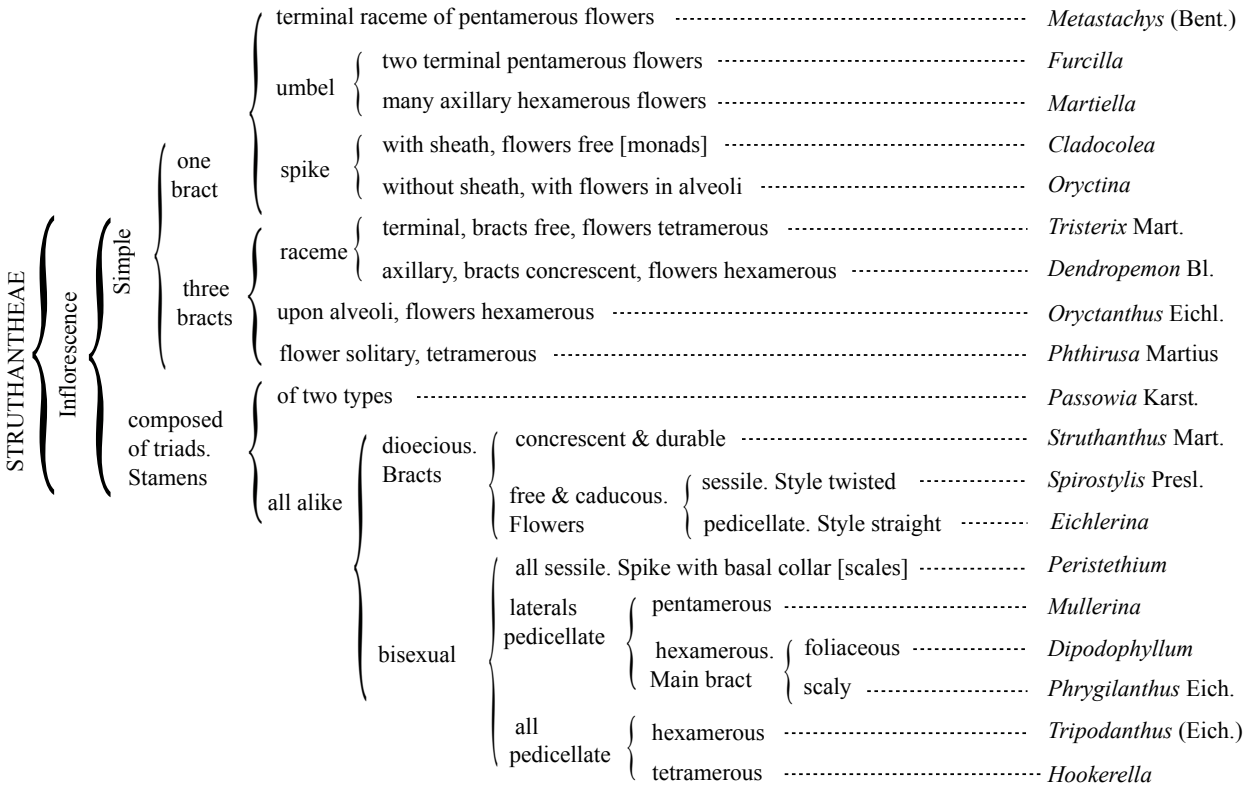
18. On the new genus TRIPODANTHUS (Eichler). - The species grouped by Eichler in the subgenus *Tripodanthus* of its genus *Phrygilanthus* (40), which we here set up the same name as a distinct genus, all have for inflorescence a raceme, axillary or terminal, of triads with hexameric flowers. In each triad, the bracts are free and quickly deciduous, and the flowers are all three pedicellate; in short, each triad is an umbellule: hence the name given to the genus. By this, the *Tripodanthus*, resemble the *Eichlerina*, from which they differ in particular by hermaphroditism.

Thus defined, this genus contains at least six species, namely *Tr. destructor* (HBK), *ligustrinus* (Willden.), *acutifolius* (RP), *eugenioides* (HBK), *flagellaris* (Ch. and Schl.), *suaveolens* (HBK), etc., widespread in Brazil and Peru. One of them, *T. eugenioides*, is not parasitic and grows on the earth forming a shrub.

19. On the new genre HOOKERELLA. - This genus has, as we know, for type the *Loranthus tenuiflorus* Hook. fil., from New Zealand (41). Of all the preceding ones it is distinguished by several characters, in particular by its inflorescence, which is a raceme of triads with all pedicellate flowers, in short of umbels, and by tetramery. We can hardly say anything else, the plant is still too little known.

IV. - CONCLUSIONS.

From all the above, it follows that the many species of Lorantheae that make up the sub-tribe of Struthantheae must be grouped for the moment into nineteen genera, the distinction of which can be briefly summarized in the following table:



Of these nineteen genera, only three: *Furcilla, Mullerina* and *Hookerella*, live in Australia and New Zealand; all the rest grow in tropical America.

FOOTNOTES

(1) Ph. Van Tieghem, Bulletin de la Soc. bot., séances du 27 juillet et du 23 novembre 1894.
(2) A. P. de Candolle, Prodromus, IV, p. 307, 1830.
(3) Eichler, Flora brasiliensis, V, 2, p. 46, 1866.
(4) Bentham et Hooker, Genera, III, p. 211, 1883.
(5) Engler, Pflanzenfamilien, III, 1, p. 179, 1889.
(6) From *tholus* (L), dôme (Fr), dome or cupola (En), and *fero* (L), je porte (Fr), bearing, wearing (En).
(7) De *furcilla* (L), fourchette (Fr), fork (En).
(8) Ph. Van Tieghem, Sur les Loranthoïdées d'Australie (Bull. de la Soc. bot., séance du 8 février 1895).
(9) De χλάδοσ (Gr), rameau (Fr), branch (En), and χολεόσ (Gr), gaine (Fr), sheath (En).
(10) Oliver, Loranthaceae mexicanae et centro-americanae (Videnskab. Meddelelser, Copenhague, 1864, p. 171).
(11) Eichler, Flora brasiliemis, V, 2, p. 91, 1866.
(12) From όρυχτός (Gr), creusé (Fr), dig (En)
(13) Prodromus, IV, p. 307, 1830.
(14) Flora, XIII, p. 108, 1830.
(15) Flora Javae, Lorantheae, p. 17, 1830.
(16) Ibid., p. 13.

(17) Ph. Van Tieghem, Sur la structure et les affinités des prétendus, genres NALLOGIA et TRIARTHRON (Bull. de la Soc. bot., séance du 26 janvier 1894).
(18) Blume, Flora Javae, Lorantheae, p. 13, 1830.
(19) Grisebach, Flora of the Brit. West Indian Islands, p. 313, 1860.
(20) Bentham et Hooker, Genera, III, p. 213, 1883.
(21) Eichler, Flora brasiliensis, V, 2, p. 87, 1866.
(22) Engler, Pflanzenfamilien, 111, 1, p. 182, 1889.
(23) A. P. De Candolle Prodromus, IV, p. 287, 1830.
(24) Martius, Flora, XXV, p. 11 O, 1830.
(25) Blume, Flora Javae Lorantheae, p. 16, 1830.
(26) Eichler, Flora brasiliensis, V, 2, p. 52, 1866.
(27) Bentham et Hooker, Genera, III, p. 212, 1883.
(28) Karsten, Bot. Zeit. 1852, p. 305.
(29) Schultes, Systema, VII, 1, p. 163, 1829.
(30) Oliver, Vidensk. Meddelelser,Copenhague, 1861, p, 173.
(31) Kunth, Nov. gen., III, p. 440, 1818.
(32) Eichler, Flora brai., V, 2, p. 70, 1866.
(33) Bentham et Hooker, Genera, III, p. 212, 1883.
(34) Eichler, Flora bras., V, 2, p. 70, 1866.
(35) De περιστήθτον (Gr), collerette (Fr), collar (En).
(36) Ph. Van Tieghem, Bull. de la Soc. bot., séances du 25 janvier et du 8 fevrier 1895.
(37) Ph. Van Tieghem, Bull. de la Soc. bot., séances du 23 novembre 1894 et du 8 février 1895.
(38) De δι (Gr), deux (Fr), two (En), πούς (Gr), pied (Fr), foot (En), and φύλλον (Gr), feuille (Fr), leaf (En).
(39) Eichler, Flora brasiliensis, V, 2, p. 45.
(40) Eichler, ibid., V, 2, pp. 48 et 50, 1866.
(41) Ph. Van Tieghem, Bull. de la Soc. bot., séance du 25 janvier 1895.