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TRITHECANTHERA, LYSIANA AND ALEPIS, THREE NEW GENERA FOR THE LORANTHACEAE FAMILY;

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The three new genera of Loranthaceae discovered more than two months ago, which, to take a date, I present today to the Society, all three belong to the subfamily Loranthoideae: the first, since the ovary is unilocular, to the tribe of Lorantheae the other two together, since the ovary is plurilocular, to the tribe of Elytrantheae.

1. On the new genus TRITHECANTHERA.

We know that the tribe Lorantheae is decomposed, according to the conformation of the calyx and the androecium, into three sub-tribes: the Phenicanthemeae, which have a dialysepalous calyx and basifixed anthers; Struthantheae, which have a dialysepalous calyx and dorsifixed and versatile anthers; Dendrophthoeae, which have a gamosepalous calyx and basifixed anthers (1). The new genus which is the subject of the first part of this Note is attached to the sub-tribe Dendrophthoeae.

The plant was found in Borneo, province of Sarawak, at the source of the Batang-Lupar, by M. Beccari, in March 1867, and bears the number 3148 in his herbarium. The samples measure 10 to 15 millimeters in diameter, the plant is very vigorous and large in size. The leaves are there in whorls of four at the top and, in the center of the whorl, the aborted terminal bud can be seen. The whorl consists of two pairs of opposite leaves, one inserted a little lower, the other a little higher. They are large, petiolate, with a leathery blade, oval, attenuated at the base and at the top, with pinnate veins, concave towards the top, clearly visible on both sides, which are dissimilar. The petiole is 2.5 to 3 centimeters long, the blade 27 to 30 centimeters long and 10 to 12 wide . Palisade at the top, the bark of the blade is crossed in all directions by star sclerites, with a very thick and strongly lignified membrane.

In the axils of the two leaves of the uppermost pair of the whorl, two flowering branches form, which diverge in a V-shape. Each of these branches, 35 to 40 centimeters long, consists of two regions. The lower region, rounded or more exactly octagonal with blunt angles, measuring 10 to 15 centimeters long with more than a centimeter in diameter at the base, bears rigid and black bracts, hollowed out in the form of deminacelles, arranged in whorls of four regularly alternate, of which there are six to eight, the bracts of a whorl are sometimes located at slightly different heights. The upper region, quadrangular, about 25 centimeters long, gradually attenuated towards the top, where it ends in a blunt point, does not bear any bracts. It constitutes a long sterile appendage, comparable to that of the inflorescence of many Araceae. This character, unique until now in the family, already makes it possible to recognize this genus among all.

In the axil of each of the pod bracts of the lower region is embedded a large sessile flower; the inflorescence is therefore an spike. The inferior ovary, shiny and black, measures about a centimeter in height, and bears, within a poorly developed caliculus, a tubular five-lobed gamosepalous calyx, thick and leathery, which measures 13 to 45 centimeters long: 9 to 41 for the tube, about 4 for the free part of the sepals. Each filament of stamen is concrescent with the sepal superimposed throughout its length and up to about the middle of the free part of the sepal;

the anther is therefore sessile. It is narrow and long, measuring 16 to 7 millimeters long by 2 millimeters wide. In addition to the two pollen sacs which it carries, as usual, on each of its sides, it offers a pair in the middle of its internal or ventral surface. At maturity, it therefore has three compartments, two lateral and one median, opening with as many longitudinal slits. In a word, the anther is trilocular and this structure, unique in the Loranthaceae family, also very rare elsewhere, seems to me to constitute the most salient character of this new genus that, according to it, I will name *Trithecanthera* (2).

The inferior ovary has, in its bark, a layer of sclerotic cells at some distance from the epidermis; the lignified cup is shaped like a drinking glass. The pistil consists of five open alternisepalous carpels, circumscribing a central cavity, soon obliterated. The style, persistent and rigid, which has the same length as the calyx, that is to say up to 15 centimeters, is surrounded at its base by a pentagonal rim, and its apex is slightly swollen in stigma.

From the sterile quadrangular appendix, which extends the axis of the spike in the form of a dagger or foil, I propose to name this species *Trithecanthera xiphostachya* (3).

Thus defined, this plant is certainly one of the most remarkable of the Loranthaceae family.

2. On the new genus LYSIANA.

The Elytrantheae tribe is broken down, according to the conformation of the calyx and the androecium, into three groups of genera or sub-tribes, namely: the Treubelleae, where the calyx is dialysepalous and the basifixed anthers, which correspond to the Phenicanthemeae in the Lorantheae tribe, the Macrosolenae, where the calyx is gamosepalous and the anthers basifixed, which correspond to the Dendrophthoeae in the Loranthae tribe; finally the Loxanthereae, where the calyx is gamosepalous and the anthers dorsifixed, although not versatile. This third sub-tribe does not have its counterpart among the Lorantheae, just as, among the latter, the Struthantheae sub-tribe does not have its counterpart among the Elytranthae. It is to the Macrosolenae, since the calyx is gamosepalous there and the anthers basifixed, that the new genus is attached which is the subject of the second part of this communication.

Preiss collected in 1839, 1840 and 1841, on the western coast of Australia, on the banks of the Swan River, near Perth, four Loranthaceae having in common the characteristic of having opposite leaves, narrow and cylindrical, which gives substantially the same shape; Miguel studied them in 1844 (4). In one of them (n°1614), a parasite on the *Casuarina*, he recognized the *Loranthus linophyllus* Fenzl, discovered in the same region in 1833, by Hügel and described by Fenzl in 1837, the other three were specifically distinguished under the names of *Loranthus Casuarinae* (N°. 1615), L. Preissii (N°.1611) and *L. scoparius* (N°. 4613). The last not having been found in flower, nothing can be said about it. *L. linophyllus* and *L. Preissii* with the flowers arranged in an umbel of triads, pentamers, with dialysepal calyx and unilocular ovary, are both Lorantheae of the Phenicanthemae sub-tribe and of the genus *Amyema*. As for *L. Casuarinae*, Miguel clearly notices that the inflorescence is different and the floral type different, but without attaching to these characters the importance they deserve, since he nevertheless intercalates this species between *L. linophyllus* Fenzl and *L. Preissii*.

The authors who followed, and in particular the two most competent botanists for Australian flora, Bentham and M. F. de Müller, have even completely overlooked these differences, since they have identified Miguel's *L. Casuarinae*, as well as his *L. Preissii* and his *L. scoparius*, with *L. linophyllus* from Fenzl.

There is, as we shall see, a serious error. The *L. Casuarinae*, not only is a species distinct from the three others of the same region which have the same shape of leaves, as Miguel saw

well, but also, contrary to the opinion of this botanist, it is very distant. It belongs, in fact, to a different tribe, where at the same time it comes to constitute the type of a new genus.

The inflorescence is a simple, pedicellate, usually biflorated umbel, not a triad umbel, as in *L. linophyllus* and all *Amyema*. The floral type is hexameric, not pentameric, as in *Amyema*. The calyx is gamosepalous, and not dialysepalous, as in *Amyema* (5). These three external differences are already sufficient to show that we are dealing with a distinct genus; the study of structure adds many more important ones. Let us leave aside the vegetative apparatus, not without having noticed, however, that the leaf of *L. Casuarinae* has its bark devoid of the sclerites that that of *L. linophyllus* possesses, a difference which, between plants living in the same place as parasites on the same trees, has its importance. Let us confine ourselves to indicating briefly the structure of the flower.

The ovary, which extends somewhat above the separation of the calyx forming a bulge below the base of the style, has its outer zone devoid of sclerotic cells, and the lignified cup therein is very long, glove finger shape. At the base of the cup, there are six larger outer bundles for the staminate sepals, and six smaller alternate ones, on a more inner circle, for the pistil. Two of the latter soon stop, and opposite the four others the central parenchyma is hollowed out by as many cubicles, early in the day obliterated by a starchy epidermis. These four cubicles extend side by side in the free upper part of the ovary to the base of the style, where they merge into an axile canal, around which the four carpellar bundles continue to the stigma.

This plurilocular structure of the ovary proves that the plant does not belong to the Lorantheae tribe, like the *Amyema*, but to that of the Elytrantheae and, since the calyx is gamosepal there and the anthers basifixed, to the Macrosolenae sub-tribe. That in this sub-tribe it constitutes a new generic type, that is what remains to be demonstrated.

In Macrosolenae, the inflorescence is simple only in *Macrosolen*, where it is a raceme, *Elytranthe*, where it is an spike, and *Lepostegeres*, where it is a flower head. In the first two genera, each flower is surrounded at its base by three bracts, the mother bract and two bracteoles, it is only in the last, that it has only one bract at its base, as in the plant that we are studying. But, in *Lepostegeres*, the inflorescence is an involucral head; here, it is a naked umbel; this difference is sufficient to show that these two genera are quite distinct.

To the new genus of Macrosolenae thus established, I will give the name of *Lysiana* (61) and the plant in question will become *Lysiana Casuarinae* (Miguel).

We see by this that certain Elytrantheae, living in the same environmental conditions as certain Lorantheae, give their leaves the same needle-like shape and take the same shape, to the point of simulating different individuals of one and the same species and of deceiving thus the most skilful observers. No example, in my opinion, shows more clearly the full extent of the error which one runs the risk of committing by persisting, as one does, in wanting to classify phanerogamous plants only according to their exterior form. It has been a long time since, for cryptogamous plants, we left this period of childhood, and we are very happy with it.

Mr. Tate described in 1883, under the name of *Loranthus Murrayi*, a Loranthaceae found by him in the central region of Australia (7). Thanks to the kindness of M. F. de Mueller, I was able to study samples of this plant.

The leaves are isolated, linear but flat, canaliculate at the top, measuring 25 millimeters long by 11 millimeters wide. In their axils we often see tufts of smaller leaves, borne by a very short twig.

The flowers are usually grouped two side by side in the axils of the leaves, forming a sessile bifloral umbel: here and there we also find solitary ones. The pedicel, more than a millimeter

long, has a fairly broad and sheathing bract under the flower. The calyx, yellow red, is gamosepalous with six divisions; the anthers are narrow and basifixed.

The ovary, devoid of sclerites, has a deep lignified cup shaped like a glove finger, and extends above the start of the calyx forming, under the base of the style, a bulge which persists after the fall of the latter. At the level of the base of the cup, there are six large external bundles for the staminate sepals and six small alternates on a more internal circle for the carpels; two of these soon stop and the central parenchyma hollows out in front of the four others as many cubicles, obliterated by the starchy epidermis, which continue in the free part of the ovary to the base of the style, where they merge into the stylar canal.

All these characters prove that this plant is an Elytrantheae of the Macrosolenae sub-tribe and, as the inflorescence is the same there as in the preceding species, it must be part of the same genus: it will therefore be *Lysiana Murrayi* (Tate). It differs mainly from *L. Casuarinae* by its flat and non-cylindrical leaves, isolated and not opposed, as well as by its sessile and non-pedicellate bifloral umbel.

Loranthus Exocarpi Behr is still attached to the same genus. In fact, the flowers are arranged there in the axils of the leaves in simple pedicellate umbels, usually biflorous, and the calyx is gamosepalous with six divisions. The ovary, devoid of sclerites, provided with a glove-like cup, extends above the start of the calyx, forming a bulge under the base of the style. At the level of the cup, there are six bundles for the staminiferous calyx and six smaller alternates, two of which abort, for the pistil. Higher up, vis-à-vis the four carpellar bundles, as many small spaces are formed, obliterated by a starchy epidermis, which extend into the upper bulge and merge into the stylar canal.

By this set of characters, we see that the plant is a Macrosolenae and that it belongs to the genus *Lysiana*: it will be *Lysiana Exocarpi* (Behr).

Finally, it is very probable that *L. linearifolius* Hooker fil., collected by Mitchell in Queensland, in 1846, from *Acacia*, is a fourth species of the same genus, resembling *L. Casuarinae* by its cylindrical leaves. The inflorescence in a simple biflora umbel, the hexameric type of the flower and its gamosepalia, at least seem to suggest this, until we can ascertain it by the plurilocular structure of the ovary. It would then be *L. linearifolia* (Hooker fil.).

Thus characterized and composed for the moment of these four species, two with cylindrical leaves (*L. Casuarinae*, *L. linearifolia*), two with flat, but narrow leaves (*L. Murrayi*, *L. Exocarpi*), the Australian genus *Lysiana* appears the simplest of all those which compose, in the tribe of Elytrantheae, the sub-tribe of Macrosolenae. Next to it takes place the genus *Lepestegeres*, which also has only one bract under each flower.

3. On the new genus ALEPIS.

It is also to the tribe of the Elytrantheae and to the sub-tribe of the Macrosolenae, since the calyx is gamosepalous there and the anthers basifixed, that the new genus which is the subject of the third part of this Note is attached.

Mr. Berggren brought back from New Zealand (Southern Island) in 1874 samples of *Loranthus flavidus* Hooker fil., collected on *Fagus Solandri* in the mountains by the Bealey River. I was able to study it in the Herbarium Baissier and I convinced myself that this plant is not a *Loranthus*, nor even a Lorantheae, but must be classified among the Elytrantheae of the Macrosolenae sub-tribe, where it comes to constitute, alongside *Lysiana*, a new genus.

The leaves, opposite at the nodes which are swollen above them in two protruding bumps, are very shorly stalked, oval, 98-20 mm long, 10 mm wide, reddish brown, without visible veins.

The flowers are arranged in a simple axillary raceme, the axis of which, quite large, bears five to six pairs of opposite pedicels spaced apart, thick and measuring 2 millimeters in length. There is no trace of a bract, neither under each pedicel naturally, nor under each ovary: this is a remarkable first character, from which we derive the name of *Alepis* for the genus (8). Does this absence of a bract under the ovary result from a complete abortion, or from an early caducity? This is what the state of the samples did not allow me to decide.

The calyx is yellow, gamosepalous, tetrameric. The ovary, devoid of sclerites, is provided with a lignified, deep cup in the shape of a glove finger; it is prolonged, above the departure of the calyx, in a swollen portion surmounted by the style and persisting after its fall. At the base of the cup, there are four external bundles for the staminate calyx and four smaller internal ones, alternating with the first, for the pistil. Opposite each of these, the parenchyma hollows out of a small cell, soon obliterated by the starchy epidermis, and these four cells, with the four corresponding bundles, extend into the upper bulge to the base of the style, where they merge into the stylar canal. There is therefore no partial abortion in the pistil here, as in the *Lysiana*.

These characters are precisely those of the Elytrantheae of the Macrosolenae group. But the plant differs from all Elytrantheae, especially *Macrosolen*, which also have the flowers in a simple raceme, by the total absence of a bract under the ovary, as well as by the tetrameria of the flower. It thus becomes the type of a new genus: it will be *Alepis flavida* (Hooker fil.).

Mr. Colenso collected in New Zealand, in the wood of Norsewood, county of Waïpawa, in 1884, also parasitizes on *Fagus Solandri*, a Loranthaceae which he named *Loranthus polychrous*. By all its characters, in particular by its upright racemose inflorescence, with a thick and quadrangular peduncle, with decussate pedicels, entirely devoid of bracts under the flower, by its gamosepalous calyx tetrameric, etc., this plant is very similar to *Alepis flavida* and most likely belongs to the same genus. The study of the structure of the ovary, when it can be made, will furnish the definitive proof. It will be *Alepis polychroa* (Colenso).

Thus characterized, with the two species that compose it for the moment, the New Zealand genus *Alepis* will take place, in the Macrosolenae group, next to the *Lepostegeres* and *Lysiana*, from which it differs by the inflorescence in a raceme, by the absence of sub-floral bract and by tetramerous flowers.

FOOTNOTES

(1) Ph. Van Tieghem, Quelques compléments à l'étude des Loranthées a calice dialysépale et anthères basifixes ou Phénicanthémées (Bull. de la Soc. bot., 16 novembre 1894).
(2) From τρι, three, θήχη, theca and άνθηρά, anther.
(3) From ξίφος, sword and στάχύς, spike.
(4) Lehmann, Plantae Preissianœ, 1, p. 219, 1844.
(5) Miguel does say, it is true, that the sepals, coherent in a tube in the bud, separate at the end, which would make the calyx dialysepalous, but there must be a material error here. I have been convinced, in fact, by successive transverse sections of the calicinal wall, that the sepals are really concrescent in their inferior region and that they do not separate at any time.
(6) From λύω, I rescue (set free), allusion to the fact that the plant is henceforth freed from the servitude in which its identification with *L. linophyllus* was held.
(7) Tate, Proceeding of the Roy. Soc. of South-Australia, VI, p. 109.
(8) From α without and λεπις, scale.