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THE LORANTHACEAE OF MADAGASCAR AND OF THE NEIGHBORING ARCHIPELAGOS

by S. BALLE

INTRODUCTION

The Loranthaceae are represented in Madagascar and in the neighboring Archipelagos by 4 genera, including 2 endemic to Loranthoideae (*Bakerella* and *Socratina*) and 2 to Viscoideae with very wide area (*Korthalsella* and *Viscum*) (cf. Pl. 1). More than 600 observed specimens are distributed there in 51 species.

If, in Madagascar and in the neighboring Archipelagos, there are only 2 genera of Loranthoideae, there are about twenty on the African continent and ten in India. On the other hand, Viscoideae are known only for one more genus (*Arceuthobium*) in continental Africa than in Madagascar and it is very rare there (only one species, represented by a few specimens only in Ethiopia); in India, we find, in addition to the 3 aforementioned genera of Viscoideae: *Ginalloa* and *Notothixos*.

The characters of the Loranthaceae from Africa were recently pre-targeted (5) and will be mainly used in the Flora of Madagascar, whose Loranthaceae will appear at the same time as this; they will therefore not be repeated here. A provisional enumeration of the African genera of Loranthoideae was presented in Webbia (3) and somewhat modified thereafter (1b); it will only become final after confirmation, by an ongoing study, of the palynological and anatomical characters; but, whatever the generic classification that will ultimately be adopted, we can already see that the evolution of the Loranthoideae was done in a completely different way, in Madagascar and on the Continent, than that of the Viscoideae[1].

For the first subfamily, one finds, in continental Africa, a great bouquet of diverse groups, related to each other by more or less numerous characters; in Madagascar, there are 2 groups that are both distant from each other and different from those of Africa: *Bakerella*, fairly primitive and homogeneous, is abundantly widespread in all parts of the Big Island and has even somewhat colonized the neighboring archipelagos; it is closely related to the Hindu genus *Taxillus*: *Socratina*, more evolved, located in 2 restricted regions of western Madagascar where it has clearly diversified, most closely resembles "*Loranthus*" *remotus* Bak. & Sprague, a species located on the other side of the Mozambique Channel, which deserves to be separated from all the others, as will be seen below.

For the Viscoideae subfamily, on the contrary, there are 2 genera. represented both on the Continent and in the neighboring Archipelagos: the largest, *Viscum*, dispersed its species throughout the Old World and shows parallel evolutions in Madagascar and on the Continent from strains with mainly western distribution (Mésandres and Pluriflores) while another strain, mainly eastern distribution (Mésogynes) reached in Mauritius (with only one specimen) the extreme western limit of its range. *Korthalsella*, widely distributed also in Indomalesia, colonized the islands of the Indian Ocean like those of the Pacific, differentiated 2 endemics to Madagascar and is represented by a species in the East of the African Continent, from Ethiopia to Cape.

The herbarium materials used for this study come, for the most part, from the collections of the Muséum d'Histoire Naturelle de Paris, where are included duplicates of the Herbiers de

Antananarivo, Natural Reserves and the Forest Service of Madagascar. The holotypes of the BAKER, SCOTT ELLIOT and TURRILL species were loaned by the Kew Herbarium; some specimens have also been sent by the British Museum in London, the Geneva Conservatory, the Herbarium of Réduit, the Botanical Institute in Munich and that in Vienna. I thank MM. the Directors of these Institutions: AUBRÉVILLE, BAEHNI, CUFODONTIS, DANDY, MERXMULER, TAYLOR, and VAUGHAN as well as MM. HUMBERT, honorary director of the Phanérogamie Laboratory of the Museum and HOMES, director of the Botanical Institute of the University of Brussels, for the help for which, to everyone, I am indebted to them.

LORANTHOIDEAE

The general characteristics of the Loranthoideae of Africa have been listed compared to those of the Loranthoideae of other Continents in Webbia (3); the main characters of *Bakerella* have been cited there and its place determined among the other African genera (Table V and fig. 14; on this subject see the observations at the bottom of pp. 15 and 14). But in *Socratina* there was only a vague allusion, this genus was still only insufficiently known at the time. It is described below.

A. – **BAKERELLA** van Tiegh.

Distinguished at the end of the last century, along with a series of others, of the same subfamily, including *Taxillus* (29), and all briefly described, the genus *Bakerella* was neither taken up by the systematists who studied the African flora, nor by DANSER, a specialist in Loranthaceae from Indomalaysia. The former continued to accept the genus *Loranthus* s. l. and include *Bakerella* as a section (17) or subsection (21) of the subgenus (or section) *Dendrophthoe*; the second includes it in his enlarged genus *Taxillus* (9) in the company of 3 other genera of VAN TIEGHEM: *Locella* from India, *Phyllodesmis* from East Asia and *Septulina* from South Africa (29).

With regard to the Loranthoideae of Madagascar, VAN TIEGHEM only mentioned, when creating the genus, that the 2 species of BAKER (*B. microcuspis* and *diplocrater*) adding that it would probably be necessary to join some others; he apparently alluded to the 9 other species described by BAKER, like the 2 above, on the material reported by BARON. Before that, 3 Malagasy *Loranthus* had already been described: *L. clavatus* by DESROUSSEAUX in 1789, *griseus* and, *sordidus* by SCOTT ELLIOT in 1890. Subsequently, 2 new species, one from Madagascar (*L. madagascaricus*), the other of the Comoros (*L. aldabrensis*) were described respectively by HOCHREUTINER in 1908 and by TURRILL in 1918. Finally 1-1. LECOMTE, in the presence of the rich collections of PERRIER DE LA BÂTHIE, added another 9 new species and sketched, very briefly in 1923, an overview of the *Loranthus* from Madagascar, of which he listed the 27 known species, in 1932, in his Catalog of Plants of Madagascar. Of these 11 were kept as species, 7 as subspecies or varieties in the genus *Bakerella* and 1 in the genus *Socratina* while the other 8 fell into synonymy. In addition, 5 species, 1 subspecies and 5 new varieties are presented below; *B. microcuspis*, the first species named for this genus, is proposed as the type species.

DANSER based his distinction from the genera of Loranthoideae almost exclusively on the structure of their inflorescences; it was perhaps a good method with regard to those of Indomaysia, where the inflorescences are generally well and variously developed and the flowers

less varied, but in Africa where it is the opposite, it is necessary to call upon other distinctive characters. It follows that if DANSER was perhaps right to reunite *Bakerella* of Madagascar with *Taxillus* s.s. from India, he probably wasn't so correct when he associated *Septulina* and *Phyllodesmis* [= *Taxillus*] so closely.

As DANSER did not give an exhaustive description of the enlarged genus *Taxillus*, that he several times changed his mind regarding the attribution to this genus of certain intermediate species between the genera *Taxillus* s.l. and *Scurrula* L. [2], and, moreover, if we exclude *Septulina* and *Bakerella*, the *Taxillus* of DANSER have an exclusively eastern distribution, the author has stuck to it, pending a more in-depth study of the species of Asia in general and India in particular, to the Malagasy group alone, which constitutes a morphologically homogeneous and geographically well defined whole, to which the generic name of *Bakerella* van Tiegh. is suitable. The detailed description can be found in the Flora of Madagascar, the synonyms, the key to the species as well as their description and their iconographic representation.

Below are listed and presented the new taxas, their types, an overview showing the variability of the genus and the way we can assume that it has evolved, its geographical distribution as well as some morphological and anatomical characteristics which had their place in the Flora. Its palynological characters will be specified in an ongoing study, relating to all the African species of this family (28).

1. **Bakerella ambongoensis** S. Balle, spec. nov. – Flora of Magagascar p. 37, fig. V. 9-11. - Pl. 4, 12.

A speciebus *B. clavata*, *B. Perrieri* and *B. tandrokense* floribus basiinflatis axillaribus nunquam umbellatis, foliisque nervis laterales 2 (1.) longe ascentes emittentibus differt.

Type: Perrier de la Bâthie 1540 (holotype P); Ambongo, lopy, sandy wood, on different shrubs; VI-1903.

This species is essentially characterized by the loss of umbels (replaced by fasciculate or solitary axillary flowers), which separates it from *B. clavata* & aff.), by the dimensions of its flowers and the shape of its buds, never 5- winged at the top, which distances it from *B. tandrokensis*, by the irregular venation of its leaves (the first 2 or 2 lower pairs of lateral veins being more marked than the following and subparallel to the median) which distinguishes it from the times of the 2 aforementioned species and of *B. Perrieri* whose leaves are different in shape and smaller, as well as by its geographical location (endemic in Ambongo). We don't know the haustoria, the fruits or the hosts.

Distribution: Iopy, Stampitsa, Majunga, Soalala, Beravi. - Pl. 6.

2. **Bakerella analamerensis** S. Ball, spec. Nov. – Flora of Madagascar p. 16, fig. 1, 8-10.

A *B. hoyifolia* calycis haud regulariter 5-lobatis, alabastris subulatis ampulla longe ellipsoïdeo differt, B. belohense foliis oppositis latioribus floribus minoribusque differt.

Type: Humbert 19210 (holotype P); Analamera, tropical rainforest of the hills and limestone plateaus between 50 and 400 m a .; 1-1938.

This species, known only from its type, endemic to Ankarana, recalls by its foliage *B. hoyifolia*, from which it differs by the shape of its buds and the originally entire edge of its calyxes (which can, with age , then split longitudinally); by its subtle buds, it is placed near *B. belohensis*, but totally differs by the shape and arrangement of its leaves, as well as by the dimensions of its flowers and by its geographic location. We know neither the haustoria, nor the fruits, nor the hosts. - Pl. 6.

3. **Bakerella belohensis** S. Balle, spec. nov. - Flora of Madagascar p. 15, fig. 1, 5-7.

A *B. collapsa* foliis alternis, floribus axillaribus, calycis duplo-triplo longioribus and ampulla apicalia alabastrorum subulata differt.

Type: Decary without number b (holotype P); Beloha; 11-1918.

This species which, by its floral characters most closely resembles *B. analamerensis*, recalls, by the shape of its leaves, *B. collapsa*, the only other species of the genus to also have particularly narrow limbs, but it differs from it by the absence of umbels (replaced by isolated or twin flowers), by its shorter calyxes, by the non-5-winged apical bulges of its buds, by its alternate leaves and by its geographical location (endemic in the south southwest of island and parasitic on *Alluaudia procera* and *Euphorbia laro*). Its glaucous leaves are 2 mm thick (Humbert). We don't know the haustoria.

Distribution: Benenitra, Beloha, Ambovombé and Amboasary. - Pl. 6.

4. **Bakerella clavata** (Desr.) S. Balle, comb. nov. - Flora of Madagascar p. 17. - Pl. 6.

A. - ssp. **clavata**: a^1 - var. **clavata**. - Flora of Madagascar, fig. 1, 11-13.

Syn. : *Loranthus clavatus* Desr. in Lam., Encycl. Method. III: 598 (1789).

Type: Martin s.n. (holotype in herb. Deless.); without place in Madagascar.

Distribution: Nossi Bé; Androranga, Andapa, Antalaha, Mananara, Zahaména, Ambatondrazaka, Ambodiriana, Vatomandry, Mananjary.

a^2. - var. **aldabrensis** (Turr.) S. Balle, comb. nov. - Flora, fig. II, 9-10. - Pl. 4, 13.

Syn. : *Loranthus aldabrensis* Turr., Kew Bull. : 203 (1918).

The only variety of the species also living outside the Island; its type (Thomasset 229) comes from Aldabra island and would have been collected on “Noia-Nonè” in IV-1907 (holotype at K).

Distribution: Mt Amber, Ankarana, Nossi Komba, Haut, Sambirano, Beondroka, Ankaïzina, Ankarafantsika, Ambato-Boeni, Andrangoloaka. Manak East, Soalala. Comoros: Aldabra.

a3. - var. **amplifolia** (H. Lec.) S. Balle, comb. nov. - Flora, fig. II, 11-13.

Syn. : *Loranthus amplifolius* H. Lec., Not. Syst. I: 39 (1923) non Merrill.

Type Perrier de la Bâthie 10701 (holotype at P); Tsaratanana, crown lichen silve around 2000 m a., On various shrubs; "Buds with reddish base and light red flowers".

Distribution: The two known specimens come from the Tsaratanana.

a^4. - var. **Baronii** (Bak.) S. Ball, comb. nov. - Flora, fig. II, 1-3. - Pl. 2.7.

Syn. : *Loranthus Baronii* Bak., Trimen's Journ. Bot. : 266 (1882). Type: Baron 20 (holotype at K); Betsileo; VI-1880.

Distribution: Ambatondrazaka, Bas-Matitana, Vohiparare, Fort Dauphin, Tsaratanana, Haute Sofia, Andilamena, Mandraka, Ankazobé, Anjojorobe, Moramanga, Manjakandriana, Antanamalaza, Ambatolampy, Ambositra, Betsileo, Ambatofinhandrahana, Ambalofitoro, Ambalofitoro, Ambatofo, Ambato Beampingaratra, Andohahela, Ampandrandrava, Arnparihifararnbolosy, Ankaramadmika, Ambalamanakana.

a^5. - var. *elongalata* S. Balle, var. nov. – Flora, fig. II, 14-15.

A var. aldabrense perigoniis, pedunculis, pedicellatisque longioribus differt.

Type: Herb. Res. Nat. Madag. 5052 (holotype P); Androy, Trananoro, Res. XI, humid forest; 111-1953.

Variety remarkable by the generalized elongation of its floral organs, located in the rain forests of in the south of the island, between 650 and 1,576 m in height, on lateritic clays and granite. We don't know the hosts; its flowers would be pink (Keraudren).

Distribution: Mt Papanga, Vohimavo, Fort Dauphin, Trananoro.

a[6]. - var. **lenticellata** (Bak.) S. Ball, comb. nov. – Flora, fig. II, 4-8.

Syn. : *Loranthus lenticellatus* Bak., Journ. Linn. Soc. XVII: 278 (1881). Kitching type without number (holotype K); Tanala; in 1879.

Distribution Tsaratanana, Marojejy, Anjanaharibe, Ambatoloana, Anjojorobe, La Mandraka, Tanala, Andringitra.

a[7].- var. **peralata** (H. Lec.) S. Ball, comb. nov. – Flora, fig. II, 16-17.

Syn. : *Loranthus peralatus* H. Lec., Not. Syst. I: 42 (1923).

Type: Perrier de la Bâthie 14185 (holotype P); coastal woods near Mahanoro; on shrubs, in IX-1921. "Two-tone pink and dark red flowers. "

Distribution Mahanoro, Matitana, Fort Dauphin, Alaotra, Ambatondrazaka, Tsitondroïna, Moramanga, Medium Mangoro, Ambalavao, Ivohibe, Andringitra.

This variety sometimes has certain flowers with 4 petals.

a[8]. - var. **tsaratanensis** (H. Lec.) S. Balle, comb. Nov – Flora. Fig. 11, 18-19.

Syn. *Loranthus tsaratanensis* H. Lec., Loc. cit., p. 43.

Type: Perrier de la Bâthie 10703 (holotype P); Tsaratanana, lichen silve around 2000 m a., On various shrubs; X-1912; “Red-orange flowers, quite variable”.

Distribution: Lokoho, Ambatosoratra, Mahanoro, Tsaratanana, Mt Amber.

B. - ssp. **sechellensis** (Bak.) S. Ball, comb. Nov. – Pl. 2, 1-2.

Syn. : *Loranthus sechellensis* Bak., Fl. Maur. and Seych .: 135 (1877). - *Taxillus sechellensis* Danser, Verh. kon. Ak. Wet. Amsterd. afd. natk 2 of sect. XXIX, 6: 126 (1933).

Type: Horne 571 (holotype K); Seychelles, Center, around 800 ft., In 1874. Only specimen observed.

Leaves with petiole 6-14 mm long by about 2 and limb oblong or oblong-elliptical, rarely oval-oblong, with obtuse apex and progressively narrowed base, 7.5-10 cm by 20-36 mm, thick and leathery , slightly discolored when dry, with a median rib usually only distinct or with 1-2 lateral ribs on each side. Umbels 2 (1) -flores, sessile (peduncle reduced to a pedestal of 2 subcircular cells); pedicels 2-4 mm long; bract obliquely cup-shaped reaching ventrally about ½ and dorsally about 1.5 mm long.

Flowers with subobconic receptacle of about 3.5 mm long and calyx with spreading edge of about 1.5 mm long, subcentric. Corolla with 4-5 petals, unknown to anthesis; claviform bud up to 30-37 mm long with apical bulge 4-5-narrowly winged; slightly wavy wings; subnull nets; linear anthers c. 4 mm long.

This plant is more particularly related to var. *aldabrensis* (localized in the North) and *clavata* (localized in the East) of which it has the robustness; it is distinguished above all by its foliage and its geographical location but the insufficiency of material calls for confirmation.

5. **Bakerella collapsa** (H. Lec.) S. Balle, comb. nov. – Flora of Madagascar, p. 25, fig. III, 1-5.

Type: Perrier de la Bâthie 852 (holotype P); Morataitra, on Betsiboka near Maevatanana, on *Cephalanthus spathelliferus*.

Distribution: the two collected specimens come from the same region. – Pl. 6.

6. **Bakerella diplocrater** (Bak.) Van Tiegh. – Flora p. 49, fig. VII, 1-3. - Pl. 4, 8-9 and 15.

Type: Baron 1383, Analamazoatra (holotype at K; isotype at P).

Distribution: Zahaména, Ambatondrazaka, Analamazoatra, La Mandraka, Moramanga, Imerina, Mangoro, Beravina. - Pl. 6.

7. **Bakerella gonoclada** (Bak.) S. Ball, comb. nov. – Flora of Madagascar, p. 29, fig. IV, 1-3. - Pl. 4, 1-2.

Type: Baron 296, Tanala (holotype at K).

Distribution: Manantenina, Maroa (Antongil Bay), Analamazoatra. Anivorano, Tanala, Vatomandry; Ijanadiana, Ambohimarangitra, Ambatovola. - Pl. 6.

8. **Bakerella grisea** (Sc. Elliot) S. Balle, comb. Nov – Flora p. 32. - Pl. 4, 5-6 and Pl. 6.

– var. *grisea* = *Loranthus griseus* Sc. Elliot, Journ. Linn. Soc. XXIX: 46 (1890). - Flora fig. IV, 4-6.

Type: Scott Elliot 2260 (holotype at K; isotype at P); wood between Fort, Dauphin and Vaingaindrano.

Distribution: Tsaratanana, Mangindrano, Beondroka, Ambatoharanana, Zahaména, Analamazoatra, Périnet, Brickaville, Farafangana. Vangaindrano, Tanandava on Manampanihy.

– var. *alata* S. Ball, var. nov. - Flora, fig. IV, 7.

A var. *grisea* ampulla apicalia alabastrorum 5-alata differt.

Type: Humbert 28435 (holotype P); Andrambovato at E. from Fianarantsoa, forest. ombrophil on gneiss laterite between 800-1000 m alt. I-1955.

Well recognizable by the narrow, slightly wavy wings presented by the apical bulge of the bud near its top. It is located in the Anilringitra (four known specimens); we don't know the hosts.

9. **Bakerella hoyifolia** (Bak.) S. Balle, comb. Nov – Flora p. 38. - P1. 4, 3 and. 14 and Pl. 6.

A. – ssp. **hoyifolia**: a^1. - var. **hoyifolia**. – Flora of Madagascar VI, 1-4.

Syn. *Loranthus hoyifolius* Bak., Journ. Linn. Soc. X VI I I: 277 (1881).

Type: Kitching s. n. (holotype K); Betsileo, in 1879.

Distribution: Androranga, Sihanaka, Sainte-Marie, Analamazoatra, Mangoro, Farafangana, Antananarivo, Ankaramadmika, Betsileo, Bezong Bezong.

a^2. – var. **basiinflata** S. Balle, var. nov. – Flora, fig. VI, 7.

A var. *hoyifolia* ampulla basalia alabastrorum differt.

Type: Humbert and Swingle 4847 (holotype P); Ambositra, Ranomena forest, around 1350 m a, VII-1928.

It is the only variety of this species to have buds provided with a basal bulge. We do not know the hosts.

Distribution: Ambondrombe and Ambositra.

a3. – var. **itrafanaombensis** S. Ball, var. nov. – Flora, fig. VI, 8.-9.

A var. *hoyifolia* bracteis fere duplo longioribus differt.

Type: Humbert 13461 (holotype P); Mt Itrafanaomby, rain forest of gneiss ridges between 1600 and 1,963 m of water; XII-1933.

It is the only Malagasy variety of this species to have long bracts; it is known only from its type.

a4. – var. **Parkeri** (Bak.) S. Balle, comb. nov. – Flora, fig. VI, 5-G.

Syn. : *Loranthus Parkeri* Bak., Journ. Linn. Soc. XX: 245 (1883).

Type: Parker s.n. (holotype at K); forest at Andrangoloaka.

Distribution: Antalaha, Haut Bemarivo, Soanierana, Analamazoatra, Tamatave, Manampanihy, Fort Dauphin, Marivorahona, Tsaratanana, Anjanaharibe, Antsianaka, Ambatondrazaka, Ankazobé, Andrangoloaka, Ambatoharanana, Ambositra, Namorona.

B. – ssp. **boïnensis** S. Balle, ssp. nov. – Flora, fig. VI, 10.

A ssp. *hoyifolia* semper unifloribus umbellatis differt.

Type: Perrier de la Bâthie 10643 (holotype P); Ambongo and Boïna, riversides, on *Eugenia*; VII-1906.

Located in Ambongo-Boïna, this subspecies is distinguished by its inflorescences in umbels uniflorous with very short axes (subsessile flowers articulated on a peduncle rarely reaching more mm in length, rarely absent. It seems to exclusively parasitize *Eugenia*.

Distribution: Boïna, Haut Bemarivo, La Beritzoka.

C. – ssp. **Bojeri** (Bak.) S. Ball, comb. Nov. – Pl. 2,3-4.

Syn. : *Loranthus Bojeri* Bak., Fl. Maur. and, Seych. : 135 (1877). - L. Glutago (Commers.) H. Lec., Nom. in Herb. P. - L. indicus Bojer Red. Maur. : 163 (1837) no Lam (1837) nec Desr. (1789) nec DG (1839).

– *L. maurilianus* Bojer, nom. in herb. P.

Pale gray twigs, with lenticels sometimes very developed, with flattened-angular ends, irregularly furrowed longitudinally, sometimes presenting a knotty appearance. Opposite leaves, sometimes alternate, rarely dull, with petiole 4-10 mm long by 1-2 and blade oblong, oblanceolate, obovate or elliptical, with rounded or obtuse apex and base cuneiform or acute, 4.5-9 cm on 20-45 mm, thick and rigid, discolored, with a slightly upturned margin, with midrib emitting, near its base, a pair of lateral ascending veins and, like it, distinct. Inflorescences axillary, in subsessile umbels, 5-2 flora, fasciculate or isolated flowers; pedicel not exceeding 4 mm long by about 3/4; bract subunilateral, ovate or slightly gibbous, with subentent margin and apex of various types such as ssp. hoyifolia, reaching ventrally 1/3 and dorsally up to 2 mm long, sometimes very widely spread. Receptive c. 2 mm and calyx c. 1 mm long, marginally distinctly 5-lobed. Red corolla with green tip, 14-25 mm long; button first claviform, then with median bulge reaching approximately the diameter of the apical bulge, with obtuse or rounded apex; lobes appearing to remain coherent in ligule almost to their tip; tube splitting unilaterally to its base; fillets fully welded to the opposite petal; linear anthers c. 2 mm long; distinctly 5-gonal disc. Oblong-obovoid false fruit, dark brown and smooth when dry, up to 10 mm by 4.

Type: Bouton s.n. (holotype K); Mauritius, Gran Bassin, thick and dark forest, in 1864.

Distribution: Located in the forests of Mauritius and Reunion, in particular, on *Diospyros* and *Jambosa*.

Still insufficiently known [3], this plant appears to represent an intermediary between *B. hoyifolia*, of which it has buds with poorly differentiated apical bulge and the foliar venation and *B. clavata* of which it would present the calyxes on the subdued edge.

10. **Bakerella mangindranensis** S. Ball, spec. nov. – Flora of Madagascar, p. 43 and fig. VI, 11-12. - Pl. 6.

A *B. hoyifolia* calycis lobis multo longioribus and angustioribus, corolla paulum longiora differt.

Type: Humbert and Capuron 25329 (holotype P): Northern Mangindrano, lichen silve on gneiss, between 2000-2200 m a .; 1-1951.

Species essentially characterized by the completely original structure of its calyxes deeply split into 5 lobes, narrowly triangular and curved outwards. In all its other characteristics, it is similar to *B. hoyifolia*. It is known only by its type. We do not know who its hosts are, the structure of its haustoria and that of its fruits.

11. **Bakerella microcuspis** (Bak.) Van Tiegh., Bull. Soc. Bot. Fr. 42: 244 (1895); Flora of Madagascar, p. 12, fig. I, 1-4. --Pl. 2, 5-6 and Pl. 4, 10.

Type: Baron 54 (holotype K; isotype P); Betsileo.

Distribution: Ankaraoka, Analamazoatra, Moramanga, La Mandraka, Betsileo. - Pl. 6.

12. **Bakerella Perrieri** S. Balle, spec. nov. - Flora of Madagascar, p. 36, fig. V, 4-8.

A *B. tandrokense* floribus plus minusve duplo minoribus, corolla basiinflata foliis minoribus differt.

Type: Perrier de la Bàthie 16339 (holotype P); Tsaratanana, ericoid bush, around 2,400 m above sea level, on Philippia; IV-1924.

High altitude species, with narrow, pinnate leaves, relatively small, living in the North of the Center (the leaves appear a little larger in the South of this sector), with flowers about twice as short as those of *B. tandrokensis* and whose the buds are distinctly dilated at the base, unlike those of the latter species. It was found on two different hosts: *Philippia* and *Weinmannia*. One of the reported specimens bore, on certain organs (twigs, leaves, receptacles), small protuberances, apparently of accidental origin, which could make the young warty fruits appear.

Distribution: Tsaratanana, Mangindrano, Ankaïzina. - Pl. 6.

13. **Bakerella Poissonii** (H. Lec.) S. Balle, comb. nov. – Flora of Madagascar, p. 45. - Pl. 2, 6; Pl. 3, 4, 7, 11; Pl. 6.

A. – ssp. *Poissonii*: a[1]. var. **Poissonii**. – Flora, fig. VI, 13-14.

Syn. : *Loranthus Poissonii* H. Lec., Not. Syst. I: 39 (1923).

Type: Poisson 230 (holotype P); around Tuléar, on "Varo" [4]: VI-1921.

Distribution: Analavenola, Manombo, Tulear, Fiherenana, Betioky, Mahafaly, Androy, Ambovombe, Fort Dauphin.

a[2]. – var. **alata** S. Ball, var. Nov.

A var. *Poissonii* ampulla apicalia alabastrorum 5-alata differt.

Type: Greve 1 (holotype P); Morondava, undated.

Variety known only by two specimens, one of which may be doubtful (Humbert 28787, represented by isolated flowers and leaves, from Haute-Malio Isalo). It is distinguished by its clearly 5-winged apical bulges, recalling several varieties of *B. elavata*, one from *B. Viguieri* and

one from *B. grisea*, but is distinguished from these species by the deciduous bracts and calyxes, which the it is only found in *B. Poissonii*. We don't know the hosts.

B. – ssp. *parvibracteata* (H. Lec.), S. Balle, comb. Nov – Flora p. 47, fig. VI, 15.

Syn. : *Loranthus parvibracteata* H. Lec., Not. Syst. I: 40 (1923). Type: Bahrain Perrier 12672 (holotype P); Analamananara, between the Sahambana and the Ihosy, forest on the western slopes, circa 1,300 ni. Ai, 1-1919.

Distribution: Ambohitantely, Tsinjoarivo, Sandrisoa, Amhalavao, Analamananara, Ambolo on Mangoro.

14. **Bakerella tandrokensis** (H. Lec.) S. Balle, comb. nov. – Flora of Madagascar, p. 34, fig. VI, 1-3.

Syn. : *Loranthus tandrokensis* H. Lec., Not. Syst. I: 40 (1923).

Type: Perrier de la Bâlthie 10667 (holotype P); Andringitra, Tandraka pass, around 1,700 m alt.; IX-1911.

Distribution: Tsitondroïna, Andringitra. - Pl. 6.

15. **Bakerella tricostata** (H. Lec.) S. Balle, comb. nov. – Flora of Madagascar, p. 47, fig. VII, 4-6. - Pl. 3, 1-2 and 5.

Syn. : *Loranthus tricostatus* H. Lec., Not. Syst. I: 41 (1923).

Type: Perrier de la Bâthie 12504 (holotype P); South of Matsiatra, around 500 m alt., On *Cephalanthus spathelliferus* and *Weinmannia* sp.

Distribution: Bemaraha, Morondava, Analafanja, Matsiatra, Ampandrandrava, Ambovombe. - Pl. 3, 3-4, 6 and 7. and Pl. 6.

16. **Bakerella Viguieri** (H. Lec.) S. Balle, eomb. nov. – Flora of Madagascar, p. 26. - Pl. 6.

– var. **Viguieri**. - Flora, fig. III, 6-8.

Syn. : *Loranthus Viguieri* H. Lec., Not. Syst. I: 41 (1923).

Type: Humbert and Viguier 996 (holotype P); Andovoranto-Moramanga, around 900 m alt.; X-1912; “Coral red flowers slightly washed with yellow at the top”.

Distribution Moramanga; Fort Dauphin.

– var. **marojejensis** S. Balle, var. nov. - Flora, fig. III, 9-11.

A var. *Viguieri* ampulla apicalia alabastrorum 5-alata differt.

Type: Humbert 22499 (holotype P); Marojejy O Manantenina, rainforest on the western slopes on gneiss laterite, around 1,400 m above sea level. XII-1948.

This variety is characterized by the apical bulges of its 5 wavy-winged buds [5], which makes it similar to the winged varieties of *B. clavata* which never have uniform flowering umbels. It is widespread in the mountains of the North Center and also exists in the Middle Center.

Distribution Tsaratanana, Anjanaharibe, Marojejy, Ambatosoratra, Haut Matitana.

DISTINCTIVE CHARACTERISTICS AND VARIABILITY

With regard to the morphology of most organs (type of inflorescence, structure of leaves and flowers), the variability of *Bakerella* is comparable to that of the large genera of Loranthoideae from continental Africa [6] and the pollen examination shows , as a first approximation, a similar structure also for all the Loranthoideae of this Continent (cf. Pl. 9).

Some species are easily recognized by extreme morphological characters: particularly granular leaves of *B. grisea* and *B. clavata* var. *amplifolia* or small from *B. microcuspis* and *B. clavata* var. *lenticellata* or narrow from *B. belohensis* and *collapsa*; quadrangular branches of *B. gonoclada*; tapered buds of *B. analamerensis* and *belohensis*, long cylindrical calyxes with deeply cup-shaped bracts of *B. diplocrater* and *tricostata* and infundibuliform calyxes with narrow triangular lobes of *B. mangindranensis*.

The flowers, almost always with 5 petals, exceptionally only 4 in certain varieties of *B. clavata*, *grisea* and *Viguieri* and this without regularity; they present on the whole, the same variations as in continental Africa as for the shape of the buds (with 1, 2 or 3 bulges ± well individualized), with the dimensions of the corollas (which are 1.6-7 cm long), their color (most often red, sometimes yellowish, exceptionally loose in a *B. clavata* var. *Baronii*), the length of the unilateral slit of the tube, in the form ± largely bi-winged lobes (a particularly frequent character in Madagascar where 32% of the number of specimens have apical bulging buds 5 (4) - winged); in the upright (generally) or reflexed (rarely) position of the lobes at anthesis, in the increasingly pronounced fusion between the corolla lobes, which makes them appear more ligulate, but this with irregularity not only from one species to another but from one flower to another on the same plant and even on the petals of the same flower (cf. Pl. 2); in the ± long fusion of the filaments with the opposite petal (much more extensive in Madagascar than in continental Africa, to the point that the anther often appears sessile), to the length of the anthers and of the calyx, to the ± deep indentations of the edge of the latter, unilateral or in cup form ± deep and on edge ± indented bracts, disc development, pinnate or ± distinctly subparallel-nerved leaves, with the usual intermediates.

It seems that in some flowers the anthers are compartmentalized, but apparently not in a constant way (cf. Flora).

There are, however, some *Bakerella* characters that deserve special mention:

1. LIANIFORM HABITS:

Relatively very rare in terms of the number of species on the African Continent [7] , it seems general among the *Bakerella* where all the specimens observed, provided with haustoria, show the same general structure of the fixing device. It is this which allows *B. grisea* to reach a length of 20 m (according to DECARY in herb.) and ensures, at least in some cases, a vegetative propagation, not only in the crown of the host, but also allows, presumably, in dense forests, the passage from a tree to the neighbor. The pl. 3 shows the primary and secondary haustoria of 2 species, apparently representative of COLIN of the others, in any case similar to those of the 6 species [8] observed in herbaria.

Haustoria of *Bakerella tricostata* (Poisson 245; host unknown). From the basal bulge of the main branch (cf. fig. 1), 2 creeping axes were born, one to the right and back, oriented at right angles to the main branch, the other to the left and in the extension of this down; the first runs along the host branch, from its origin and implants there over a distance of about 6 cm, 4 secondary haustoria, all located in the same plane and directed from top to bottom; their diameter is about 0.5 cm and their thickness, between the 2 branches, from 1-2 mm; at the second haustorium, the axis carries a leafy branch, erected parallel to the main branch and, 2 leaves, fixed side by side, on either side of the base thereof (the right one being partially broken), on a kind of very short discoid internode (approx. 1 mm); the other creeping axis is curved to the left from its base, and has formed a secondary haustorium with the host branch within 1 cm of the main haustorium, then, bypassing a branching of the host branch that is broken a little above its

base, the creeping axis formed a loop to the right then another upwards (the latter encircling the host branch) to return to the right, anastomosing first with itself under its first secondary haustorium, then running in parallel below the host branch where it gave rise to 5 secondary haustoria, similar to those of the first creeping axis [epicortical root] and like them all located in the same plane, but oriented in opposite directions; the first between them is located exactly under the main haustorium (see fig. 2); at the level of the penultimate axis carries a leafy branch and opposite the first a single leaf, which seems to emerge from a tear in the bark; while secondary haustoria are all born in the same plane from each of the 2 creeping axes' the leafy branches and the leaf are located in planes oriented at approximately 45˚ from that of the secondary haustoria.

The section of the host branch at its extreme right (fig. 5) shows, at the secondary haustorium of the lower creeping axis, the importance of the penetration of the parasite into the wood of the host and the reaction of it around the haustorium.

Haustorium of *Bakerella Viguieri* var. *marojejensis* (Perrier de la Bâthie 16470, on *Oncostemon* sp.). - The main branch of the parasite was severed at its base, immediately above the origin of 3 creeping axes, one of which, located at the rear, was also cut at its base, the other 2 run together, right to left, subparallel to the host branch in which they each insert secondary haustoria similar to those described above for *B. tricostata*. Towards the middle of fig. 3 we see, the upper creeping axis which carries (between 2 haustoria) an upright, leafy branch (at its end not shown); a little further to the left, the lower creeping axis gave rise, also upwards, to a ramification similar to it in appearance but a little thinner, oriented parallel to it and swollen at its end; under this bulge we see a similar ramification of a fragment of the third axis, remained attached by its suckers to the host branch and a little further another ramification, still similar, of the first axis; these creeping ramifications are in turn branched and swollen at their ends. The bulges, ellipsoid-globular, almost 1 cm long by a little more than ½ wide, apparently represent galls because we see a series of small circular orifices with regular edges, all located in the region which faces the host branch and corresponds to the opening of subcylindrical cubicles, and subparallel to each other. On the other side (fig. 4) the host branch has been cut subtangentially at each end and shows, at certain secondary haustoria, the parasite's tissues appearing, in the form of plano-convex lenticular spots inside the host wood; this tissue has the same structure as that shown in the middle part of fig. 5, the sclerotic strands being sectioned transversely; this shows that the growth of the haustorium takes place mainly in the transverse direction; but the edges of the lenses show that the progression also takes place longitudinally. The transverse growth manifests itself, moreover, by a bursting of the bark of the host which generally has the shape of a large lenticel which can be seen in the middle of fig. 4.

The creeping axes do not appear to have a root structure and the haustoria show a structure similar to that observed by SINGH on *Dendrophthoe falcata* (L. f.) Ettings. (25). A more detailed study of these haustoria is in progress, within the framework of the species of Africa s.l. with the aim of continuing the interesting observations already made by THODAY (27) and SOYER-POSKIN and, SCHMITZ (24).

2. SCLEREIDS:

We find, very frequently, sclerids in Loranthaceae, but if they are mentioned here it is because of their situation and their enlargement in foliar limbs, as well as their abundance in all the organs of the plant (twigs and creeping axes, leaves, flowers and fruit) and we are surprised to find thus “armed” leaves that collectors already report from fresh [material] as particularly

brittle; this overlapping of sclerified arms would therefore not be compensation for the "drowned" ribs of the majority of species, reported by the same collectors; for the rest, we find in the leaves as in the stems of *Bakerella* a normal structure of Loranthoideae (cf. Pl. 4, 1, 14 and 15, Adansonia (1961) Pl. 2, 3 and 9) and Bibliography (7) and (22).

3. UNIFLOROUS UMBELS:

We find, on the African Continent, a large number of umbellate ± multifloral species and intermediates between them and the isolated flowers but never, on thousands of specimens observed, none regularly presented uniflorous umbels, like those of 2 Madagascan species: *B. Viguieri* (specific character: Flora fig. III, 8) and *B. hoyifolia* ssp. *boïnensis* (subspecies character: Flora fig. VI, 10).

4. BRACTS AND CADUCOUS CALYCES:

In no case has it been observed on the African Continent of species with bracts and calyxes not persistent on the fruit; this character being without exception in *B. Poissonii* it can be considered as well fixed; while being linked to the simplest and most reduced form of bracts, it does not prevent the variation in length of the calyxes (cf. Flora fig. VI, 13 and 14). Deciduous bracts are also found in a New Zealand Elytranthinae, *Alepis flavida* (Hook.f.) van Tiegh., A species quite different from *Bakerella* in its plurilocular ovary, its umbels with 10-16 flowers with 4 petals fused only in their bottom half.

5. HYPERTROPHIC-FLESHY FLOWERS AND FRUITS:

No species from continental Africa bears flowers comparable to those of *B. grisea* in terms of the thickness of its corolla, which is double that of its closest relative, *B. clavata*; the number of cells is also double but the comparative palynological examination of the 2 species did not reveal that it could be a case of polyploidy (see the buds of the 2 species in the Flora, fig. I, 11 -12, and Fig. IV, 5 and 7.

EVOLUTION OF THE GENUS

We can suppose that the genus *Bakerella* would have evolved from an ancestor having had the following characters:

Glabrous plant, with subcylindrical branches, fixed on its host by 1 (or more?) haustoria, with thin, alternate leaves, petiolate and pinnate, with few-flowered, umbelliform inflorescences with long axes, terminating short leafy branches, with reduced, unilateral and persistent bracts, smooth receptacle, urceolate calyx with short edge and not very deeply lobed, with a rounded bud and thin corolla with (? 4) -5 petals fused over most of their length into a tube devoid of appendages and internal folds and, external protrusions, splitting unilaterally at anthesis, with sublinear lobes remaining erect, with linear filaments without teeth, fused by their base to the opposite petal, and remaining erect, with linear anthers with non-partitioned theca and undifferentiated connective, to subfiliform style, with slightly differentiated stigma and disc and smooth false fruit.

From such a plant were able to differentiate the species, in a way comparable to that which one observes in several genera of continental Africa and in 3 selected directions:

a) By reduction of certain internodes (hence subopposite then opposite leaves).

b) By extension of the flattening of the branches, first at the nodes and then over the entire length of the internodes (hence quadrangular stems).

c) By irregular development of the lateral veins (hence passage from pinnate to subbasal venation).

d) By loss of short flowering branches (hence axillary inflorescences).

e) By shortening the axes of the inflorescences (hence flower heads, fascicles, then sessile flowers) and reduction in the number of umbel flowers (from 5 to 1 in current species).

f) By more and more accentuated differentiation of the bracts (indentations of the edge, dorsal hypertrophies, elongation in an increasingly deep cup, or on the contrary degeneration (caducousness).

g) By increasingly accentuated differentiation of the calyxes (endentation on the margin, enlargement or degeneration as in the case of bracts).

h) By more and more accentuated differentiation of the corollas (thin flowers becoming thick; subulate, sub-cylindrical buds swelling at the top, at the base and in the middle, tube cracking more and more deeply unilaterally, lobes becoming fused together more and more higher, becoming bilaterally winged, bending at the anthesis).

i) By more and more pronounced fusion of the filaments with the opposite petal, the latter eventually disappearing (which never appears on the African Continent).

j) By shortening the anthers.

k) By increasing the disc.

The table below summarizes this development and indicates the interspecific affinities.[9]

AFFINITIES WITH OTHER GENERA AND ORIGINS

Bakerella is related, on the one hand, to the Loranthoideae of Asia and, on the other hand, to those of continental Africa; but it is undoubtedly with *Taxillus* s. s. and the *Locella* from India that they show the most affinities, differing essentially only in the following characteristics: their complete glabrousity [10] (the 2 other groups bear scales), the presence of ± large branched sclereids in leaf limbs as well as in twigs, receptacles and petals, (absent in the other 2 groups) and the drinking glass shape of the receptacular collenchymal cup (shaped as a block in *Taxillus* s.s. and *Locella*); more complete information on Asian species will indicate the systematic importance to be given to these characters.

DANSER (8-9) taking the genus *Taxillus* s. s. de VAN TIEGHEM (based on 2 species) considerably increased its acceptance: in 1940 there were 54 species and had extended its area from South-West Africa to Japan and Borneo; he incorporated, in particular, *Septulina* van Tiegh. from South Africa, which differ not only in the same characters as *Taxillus* s. s. and *Locella* but also by the number of petals and stamens (4 against 5), a character perhaps without much importance in Indomalesia but generally well fixed among African groups.

The place of *Bakerella* among the African Loranthoideae was indicated in Webbia (Fig. 14) within *Taxillus*, then admitted in the sense of DANSER (with however the nuance that DANSER includes *Remoli* in *Tapinanthus*, which the erect position of their filaments does not not justify). If this place must be maintained, in all of the groups, both for *Septulina* and for *Bakerella*, it no longer currently seems appropriate to generically reunite these 3 groups, nor with the *Remoli* that would be closer to *Socratina* than to *Bakerella* for the reasons that will be seen later.

By their stamens with filaments remaining erect and undifferentiated, *Bakerella* is similar to the Loranthoideae of Indomalaysia in general and those of Africa considered as the most primitive, in particular (*Amyema*, *Dendrophthoe*, *Helixanthera*, *Plicopetalus* [= *Plicosepalus*] and *Tapinostemma*); by their zygomorphic flowers with 5 petals and tube longer than the lobes, splitting unilaterally at anthesis, they approach, on the contrary, more advanced genera (*Agelanthus*, *Phragmanthera* and *Tapinanthus*) which offer the same tendencies in general variability and also show this peculiarity found in *Bakerella*, to form wings on the edge of the petals. By the 2 tendencies indicated above, *Bakerella* approaches the sect. *Remoli* but it deviates from it by a remarkable character to which we will return to within the subject of *Socratina*: the absence of hair on the style.

By the presence of sclereids independent of the conductive system in the leaf blade, *Bakerella* is related to the following African genera: *Dendrophthoë*, *Helixanthera*, *Phragmanthera*, *Plicopetalus* [= *Plicosepalus*] and *Tapinostemma*, genera which, like *Bakerella*, also present, at least in some cases , the lianiform habit, much more frequent, it seems, on Continents other than Africa.

As for the possible origin of the genus, it seems that it should rather be sought in an ancestor common to both the *Dendrophthoë* (in the sense of DANSER) with 5 petals and the *Scurrula* with 4 petals, both hairy, as well as with *Phyllodesmis* [= *Taxillus*] (glabrous genus with 4 petals which is the counterpart, in the East, with Western *Bakerella*, glabrous and with 5 petals), rather than directly with *Dendrophthoë*, as proposed by DANSER.

GEOGRAPHICAL DISTRIBUTION OF BAKERELLA (Pl. 6)

Nearly 300 specimens of *Bakerella* have been collected in Madagascar and in neighboring Archipelagos, which are distributed as follows:

<table>
<tr><td colspan="12">MADAGASCAR
278 specimens; 16 species</td><td colspan="3" rowspan="2">ARCHIPELAGOS
14 specimens
2 species</td></tr>
<tr><td colspan="6">DU VENT REGION
236 specimens
13 species
with
5 endemic</td><td colspan="6">SOUS LE VENT REGION
42 specimens
8 species
with
3 endemic</td></tr>
<tr><td colspan="12"></td><td>COMORES</td><td>MASCARENES</td><td>SEYCHELLES</td></tr>
<tr><td colspan="3">EAST
79 spec.
7 spp.</td><td>SAMBIR
2 spec.
2 spp.</td><td colspan="3">CENTRAL
155 spec.
12 spp.</td><td colspan="4">WEST
24 spec.
7 spp.</td><td colspan="2">SOUTH
18 spec.
2 spp.</td><td>4 spec.
1 sp.</td><td>9 spec.
1 sp.</td><td>1 spec.
1 sp.</td></tr>
<tr><td>N</td><td>M</td><td>S</td><td></td><td>N</td><td>M</td><td>S</td><td>N</td><td>AB</td><td>M</td><td>S</td><td>MA</td><td>AN</td><td colspan="3" rowspan="3"></td></tr>
<tr><td>13</td><td>38</td><td>28</td><td></td><td>40</td><td>98</td><td>17</td><td>8</td><td>14</td><td>1</td><td>1</td><td>9</td><td>9</td></tr>
<tr><td>5</td><td>5</td><td>6</td><td></td><td>7</td><td>10</td><td>4</td><td>2</td><td>4</td><td>1</td><td>1</td><td>1</td><td>2</td></tr>
</table>

From this distribution we can conclude that:

1. The largest number of samples was collected in the du Vent Region in general, and in particular in the Center-middle, Center-north and East east.

2. It is in the Leeward Region in general, but, in particular, in the Sambirano, the Southwest and the West-Middle, in the Northeast, the Ambongo, the North West, the Center-south and Androy that the greatest diversity of species was collected relative to the number of specimens; but it should be noted that this number is so small for the following sectors that it could be misleading (1 for the West and the Southwest, and 2 for the Sambirano).

3. 12 out of 16 species are located in one of the regions, 9 in one of the Areas and 8 in one of the Sectors. 5 species are found only in the Pile Center, 3 in the North and 1 in the S; 1 species is endemic in the North-West (Analaniera) and another in the High Mountains of the North (Mangindrano).

4. While in the Southeast there are times more *Bakerella* than *Viscum* for the same number of specimens reported, in the Center-south there is the same quantity and in Mahafaly there are 3 times more *Viscum* than from *Bakerella*.

5. It is in the Center and in the East. that we encountered the greatest number of subdivisions of species represented.

6. Endemics are found, in general, especially in the Center and the West and, in particular, in the Center-middle and in the Center-north.

7. In the Archipelagos, only 2 species emigrated, those whose area is the most extensive in Madagascar and from which the largest number of specimens has been collected (11 for *B. clavata* and 60 for *B. hoyifolia*).

HOSTS

The generic identity of the hosts of 8 of the 16 *Bakerella* species is known; they are distributed, between 18 families of Dicotyledons ranging from the most primitive to the most advanced. They are presented below, according to the HUTCHINSON classification. (19). [arranged alphabetically here].

ANACARDIACEAE :
Mangfera indica L. : *B. clavata* var. *clavata* (Rés. Nat. 3358). – *Protorhus sp. B.tricostata* (Seyrig 33). – *Bleus Grundidieri* Engl. *: B. tricostata* (Humbert 14319) (Seyrig 33) (Tan. 5001 et 6006). -- *Sorindeia madagascariensis* Thou. ex DC. sub "Tsirindra" : *B. clavata* var. *clavata* (Pd1B 10707).
ARALIACEAE :
Genre indéterminé : *B. clatata* var. *aldabrensis* (Humbert 31/u, 1960).
CHLAENACEAE :
Leptolaena pauciflora Bals. : *B. hoyifolia* var. *Parkeri* (Perr. de la Bâth. 10692).
COMPOSITAE :
Vernonia sp. : *B. clatata* var. *Baronii* (Perr. de la Bâth. 10690), *B. clatata* var. *peralata* (Cours 602) sub « Ambiaty »:
CUNONIACEAE :
Weinmannia sp. : *B. clavata* var. *amplifolia* (Perr. de la Bâth. 10701), *B. Perrieri* (Perr. de la Bâth. 16338), *B. tricostata* (Perr. de la Bâth. 12501).
DIDIERACEAE :
Alluoudia procura Drake : *B. belohensis* (Decary 8345).
EBENACEAE :
Diospyros sp. : *B. hoyifolia* ssp. *Bojeri* (Vaughan s. n°, Ile Maurice).
ERICACEAE :
Philippia sp. : *B. hoyifolia* var. *Parkeri* (Perr. de la Bâth. 16133), *B. Perrieri* (Perr. de la Bath. 16339), *B. Poissonii* ssp. *parvibracteata* (Perr. de la Bâth. 16939).

EUPHORBIACEAE :
Euphorbia laro Drake : *B. belohensis* (Perr. de la Bâth. 12737). – *Givotia madagascariensis* Baill.? sub « Varo » : *B. Poissonii* var. *Poissonii* (Poisson 230).
GUTTIFEREAE :
Calophyllum sp. : *B. hoyifolia* var. *hoyifolia* (Boivin s. no). – *Psorospermum* sp. : *B. clatata* var. *Baronii* (Perr. de la Bâth. 10698 et 10710).
HYPERICACEAE :
Haronga sp. : *B. clatata* var. *tsaratanensis* (Homolle 438). – *Symphonia* sp. : *B. hoyifolia* var. *hoyifolia* (Perr. de la Bâth. 10636):
MALVACEAE?
Hibiscus liliaceus L. sub « Varo » : *B. Poissonii* var. *Poissonii* (Poisson 230).
MORACEAE :
Ficus sp. : B. clavata var. *Baronii* (Seyrig 848). *B. Poissonii* ssp. *Poissonii* (Poisson 215).
MYRSINACEAE :
Maesa sp. : *B. clatata* var. *Baronii* (Tan. 2387). – *Oncostemon* sp. : *B. Viguieri* var. *marojejensis* (Perr. 16470).
RUBIACEAE :
MYRTACEAE :
Eugenia sakalavarum Perr. : *B. hoyifolia* ssp. *boinensis* (Perr. de la Bâth. 10648).
Eugenia sp. : *B. hoyifolia* ssp. *Bojeri* (Anonyme, Ile Maurice). – *Jambosa* sp. : *B. hoyifolia* ssp. *Bojeri* (Anonyme, Ile Maurice). – Genus undetermined: *B. hoyifolia* var. *hoyifolia* (Perr. de la Bâth. 10637.
RUTACEAE :
Citrus aurantium Risso : *B. clatata* var. *aldabrensis* (Perr. de la Bâth. 10657). – *C. medica* Risso : *B. gonoclada* (Guillot 59).
Cephalanthus spathelliferus Bak. : *B. collapsa* (Perr. de la Bâth. 852), *B. tricostala* Perr. de la Bâth. 12504) (Seyrig 42). – *Coffra* sp. : *B. clavata* var. *clatata* (Humbert 21983). – *Gaertnera* sp. : *B. hoyifolia* var. *hoyifolia* (Boivin s. n°).
SAMYDACEAE :
Genus undetermined : *B. clavata* var. *amplifolia* (Perr. de la Bâth. 10701).
TAMARICACEAE :
Tamarix sp. : *B. clatata* var. *aldabrensis* (Dupont 107).

B. – **SOCRATINA** S. Ball, gen. nov.

Suffrutex tomentosus, pais stellatis ramosis, floribus 5-gamopetalis. filamentis convolutis, stylis pilosis, omnibus generis vicinis lobis intus pilosis distinctissimus.

This genus, as well as the 2 species it includes, is described, in detail and figured in the Flora of Madagascar. Only the characters will be indicated here which, by their original combination, distinguish it from the other western genera of Loranthoideae Hypheatines (8-9).

ESSENTIAL CHARACTERS AND AFFINITIES WITH OTHER GENERA

UNIQUE CHARACTER:

Presence of stiff, appressed, simple hairs on the internal surface of the corolla lobes: (cf. pl. 7, 7 to 9); Flora of Madagascar, fig. VII, 10 and Not. Syst. I, fig. I (1923).

Among all the Loranthoideae of Africa s. J., *Socratina* is the only one to present hairs in this place and also to present this type of hair; it is mainly because they deserve to be genetically separated, the unique characters being quite exceptional in this subfamily on this continent.

DANSER signals (11) the presence, sometimes, of stellate hairs inside the lobes of the petals of *Taxillus chinensis* (DC) Dans.; I have not been able to observe them on the few specimens of this species which I have been given the opportunity to examine. But, in any case, *T. chinensis* is

a very different species from the *Socratina*, with its umbellate flowers, with 4 petals, with compartmentalized anthers and young warty fruits, living from the south of China in the Philippines and Borneo and the hairs are of different types since simple in one case and stellate in the other. As for *Amyema barbellata* (Blak.) Dans., it is a species of Australia, known by its type only; it would carry a tuft of hairs inside the petals but would, moreover, be hairless and look nothing like the *Socratina*.

EXCEPTIONAL CHARACTER:

Presence of multicellular hairs with alternate ramifications on the middle part of the style: cf. pl. 7, 10 to 12; Flora of Madagascar, fig. VII, 14 and Not. Syst. I, fig. I-1923).

We find this character only in a single species of Loranthoideae on the African Continent (*Loranthus remotus* Bak. & Sprague) which, as such, deserves to be separated from all the others, what SPRAGUE had already done by creating for it the *Remoli* section (26) and which presents morphological and anatomical characters which resemble it, at the same time. *Bakerella* on the one hand, and *Socratina* on the other; it lives on the other side of the Mozambique Channel.

The presence of hairs on the style has been illustrated for *Elytranthe capitellata* (Wight & Arn.) Engl. (30), Loranthoideae of India, belonging to another sub-tribe than those of Africa and very different from them in many respects (plurilocular ovary, inflorescences in raceme with cellular rachis, bract accompanied by 2 bracteoles, corolla with 6 petals and style articulated in 2 parts; moreover it is in the upper part where the hairs are located.

GENERAL CHARACTERISTICS

1. Flowers with 5 petals fused into a tube, at least as long as the lobes and devoid of folds or internal appendages and external gibbosities; filamentous stamens, winding up at anthesis and non-partitioned anthers, are characters found in most genera of continental Africa.

2. Tendency to zygomorphy of the corolla by unilateral cleft; is also common on the African continent; but it manifests itself in *Socratina* in a somewhat peculiar manner; the flower would open there in 3 stages: first appears a unilateral slit which transforms the upper part of the bud into a sort of tray; then the 4 other separating slits open, the lobes except at their ends (cf. pl. 8); finally the lobes separate their summits. As far as we know the fully opened flowers of *S. Keraudreniana*, we can see a degree of zygomorphy a little less marked than in *S. bemarivensis* since in the flowers of this last species the unilateral slit extends into the tube, this that does not seem to be the case for *S. Keraudreniana*.

3. The tendency to differentiate the filaments (carried out on the Continent in the greatest number of genera) is manifested here in 3 ways in *S. Keraudreniana* and 2 in *S. bemarivensis*: winding at anthesis, ± marked differentiation of the apical tooth, which can sometimes be emarginate as in the localized genus *Tieghemia* [=*Oncocalyx*], with 2 different species also from this point of view, in East Africa, from Kenya to Natal: cf. (I, b) and presence of stamen hairs [11].

4. The presence of hairs with whorled ramifications in stages, which has been observed in the following continental genera (at least on young vegetative organs: *Botryoloranthus* [*Oncella*], *Dendrophthoe*, *Erianthemum*, *Oncella*, *Phragmanthera* and *Septulina*) cf. pl. 7, fig. 1 to 6. Such hairs are also found in several Indomalaysian genera of Loranthoideae, notably in *Dendrophthöe*, *Scurrula* and *Taxillus* s. s.

5. The absence of sclereids independent of the veins in the leaf blades; this is the case for the majority of continental genera.

6. The structure of the pollen, which is broadly similar to that which is observed in all the Loranthoideae of the continent (cf. pl. 9); the differential details will be clarified in an in-depth work in progress.

NEW EVOLUTION AND DIFFERENTIATION

Socratina is attached to the primitive types of Loranthoideae Hypheatinae by their subcylindrical branches, their sometimes alternate leaves, their often terminal inflorescences, their unilateral bracts, their undifferentiated calyxes, their corollas with lobes remaining erect at anthesis, their whole anthers relatively long ; but by the majority of their characters they reach a relatively high evolutionary level, compared to other African genera; this would be at .. points in Table 5 of Webbia, the allocation of 4 points being required for exceptional characters (style and hairy lobes).

It is under 2 aspects, representative of 2 of the most typical forms of flowers which one meets on the African Continent, that one finds *Socratina* in Madagascar; that with flowers provided with a relatively short tube, with filaments fused to the opposite lobe well beyond the base thereof and where, generally [12] the tube does not split at anthesis, and that with flowers presenting a long tube, which always splits unilaterally at the anthesis and filaments becoming free, roughly at the base of the lobes; *S. Keraudreniana* belongs to the first group and *S. bemarivensis* to the second.

Finally, these two species are localized in very distinct areas, distant from each other and each relatively very limited (the first in the South, the second in the West of Pile: cf. pl. 1) and the appearance of their leaves and flowers (oblanceolate-obovate limbs 3-8 mm wide in *S. Keraudreniana*, suborbicular or broadly oval and 0.6-4.8 cm wide in *S. bemarivensis*; thin corollas and, delicate from the first, thick and covered with a long and dense tomentum in the second) allows them to be recognized at first glance.

SPECIES

1. **Socratina Keraudreniana** S. Balle, Nov. spec., Spec. typus.

Corolla gracilis, tubo quam lobis subaequilongo, haud unilateraliter fisso Ch. Apice in alabast.ro ellipsoïdea brieve apiculata, filamenta supra basim labarum inserts; ad apicem dente breve producta, anthera linearis, calvcis breve, 5-dentatis, bractea ovata calici aequans vel Paulo longiores; folia parva. oblanceolata vel obovata, alterna vel opposita, 1 (3) nervis.

Type: Humbert, 19902 (holotype P); Fiherenana Gorges, between Ikanty and. Anjamala, tropical forest and, shiny xerophile on limestone scum, between 30-300 m of water .; I 1947.

Described (p. 33) and illustrated (flowering branch, end of bud, bract, receptacle and calyx, stamen: fig. VII, 11-15) in the Flora of Madagascar, it was photographed in situ by one of the collectors (pl. 8).

Pollen: Isopolar, breviaxial (P = 22 μ, E = 40 μ), tricolpate (syncolpate) grains, with angulapertured lobes with very sharp furrow edges; exine almost smooth, tectate, thicker along 2 bands located towards the poles in each mesocolpium; this increase in thickness is due to the increase in the dimensions of the columellae; the mesocolpium has a granular appearance due to short sub-columnar columella [13] (pl. 9).

Distribution: South-southwest, from Madagascar: Gorges around Tuléar (Keraudren 1368) and around Lake Tsimanampatsatsa (Leandri 4034).

One of the collected specimens (Leandri 4034) was attacked by a parasitic fungus *Aecidium Cookeanum* de Toni (syn. *A. Loranthi* Cooke) which causes not only an efflorescence of white cups on the leaves, but also a deformation of the majority of the limb which shorten and becomes bilobed as well as the appearance of brownish tumors at the base of the branches (pl. 7, fig. 1.5 to 18). Mr. Cl. MOREAU mycologist at the Cryptogamy laboratory of the Museum determined this fungus and specified that Uredinales was found on various other African Loranthaceae: *Agelanthus Zeyheri* (Harv.) S. Balle, *Erianthemum Dregei* (Eckl. & Zeyh.) Tiegh, *Viscum triflorum* DC and an undetermined *Loranthus* from Côte d'Ivoire.

2. **Socratina bemarivensis** (H. Lee.) S. Ball, comb. Nov.

Syn. : *Loranthus bemarivensis* H. Lec., Not. Syst. I: 37, fig. I (1923).

–*Tapinanthus bemarivensis* Dance, Verb. kon. Alc. Wet. Amsterd. afd. Natk. 2 ser. XXIX, G: 67 and 108 (1933).

Type: Perrier de La Bâthie 1064G (holotype P); Boïna, 17˚ lat., Wood north of Bemarivo, on *Eugenia*, *Dalbergia* and *Vernonia*.

A second specimen was brought back, by the same collector, from the same region: edge of the Anavila, tributary of the Bemarivo, on *Acacia* in VII-1905 (Terrier 10652). This collector left, in the herbarium of the Museum, about the fertilization of flowers, a handwritten note which is summarized below:

"The plant flowers all year round but fruits at a well-defined time [14], probably in relation to the fertilizing insect; it attacks large hardwood trees (*Eugenia*, *Dalbergia* and *Vernonia*) as well as *Acacia*; the flower, when ripe, abruptly opens by a longitudinal slit separating 2 of the petals over a length of about 25 mm from the top; the corolla then appears as a tube extended by a curved ligule in an oblong basket, the tops of the petals remaining coherent; at the same time the filaments curl abruptly, expelling downwards, the pollen of the anthers introrse early dehiscent, on the hairs of the style, thanks to the thickened base of the connective (cf. apical tooth of the filaments); these, by bending, hook and curl the style, obliquely or horizontally, at the top of its piliferous region, which removes the stigma from the region where the pollen has accumulated, a mechanism favorable to cross-fertilization. Insects, necessarily smaller than bees, attracted by the abundance of sweet nectar secreted at the bottom of the tube, probably touch the stigma while seeking the entrance to the tube of the flower; but they can only enter it when, at the end of the anthesis, the filaments continuing to curl, bring the anthers up higher, emptied of their content; by entering it, they touch the hairs of the style, loaded with pollen which they can then transport on to another stigma."

VISCOIDEAE

Their distinctive characteristics from the Loranthoideae have been indicated in the Flora of Madagascar; without prejudging the detailed study, in progress, of the pollen of African species, we can already realize how different is the structure of those of Loranthoideae and Viscoideae, at least in Africa; this is illustrated in pl. 9; this agrees with the opinion of the Indian embryologists who indicated the other reasons for separating the 2 sub-families (20).

While the genus *Viscum* is well represented in Madagascar (285 specimens for 29 species) and *Korthalsella* is rare there (33 specimens for 3 species), the opposite is the case in

neighboring Archipelagos (33 specimens of *Korthalsella* against 13 for *Viscum* for 1 species of the first genus and 3 of the second, however it should be noted that an eastern species of *Viscum* (*V. articulatum*) has been found (once only) in Mauritius, on the other hand, if *Korthalsella* is, numerically , relatively abundant in the archipelagos, it is less diversified there than in the Great Island, where it gave rise in the High Mountains to 2 endemic species (cf. pl. 1).

C. – **VISCUM** L. ex Tourn.

The species of this genus found in Madagascar have been presented in a preliminary work (4) that the author had feared he could not pursue; a detailed study of the genus *Viscum* for Africa s. l. is currently in progress, both palynologically and anatomically; it will only be given here an indication of the changes that have been made to the delimitation of species since 1960, following the examination of some new collections and some duplicates of the Herbarium of the Museum not previously observed.

NEW SPECIES FOR AFRICA S. 1.: **V. articulatum** Burm f. s. l.

The sample (Anonymous in Herb. P.) that VAN TIEGHEM had labeled *Aspidixia mauritiana* (nomen) is composed of a few fragments of flattened twigs, 2 to 3 dcm long, with internodes 0.3-3.7 cm long by 1-4 wide and barely 1 thick, slightly enlarged from bottom to top, with faces presenting 1 median rib little protruding, sometimes accompanied by 2 others less marked. The cataphylls, like the prophylls, are not very distinct and only near the ends of the branches, not exceeding 1/3 mm long. The axillary inflorescences consist of single or multi-flowered cymules, composed of one or more bibracteal cups superposed-decussate, sessile, about 1 mm long and with rounded lobes; when they contain only one flower, it can be male or female; when several cups are superposed, the last one is uniflorous and the underlying bi- (uni-) floral; the flowers of these cups may or may not be contained in a lateral cup.

Flowers sessile, males with 4 tepals, 3/4-1 mm long; suborbicular anthers with a dozen (?) indistinct locules; female flowers unknown at anthesis, with a subcylindrical-urceolate receptacle c. 3/4 mm long and bulging disc (tepals, style and stigmas fallen). False sub-spherical fruit about 3 mm in diameter, smooth, light brown to dry, sessile, with suborbicular albumen about 3 mm in diameter and about 1/2 mm thick.

BETTER KNOWN SPECIES:

The male flowers of three species known only so far by the female sex have been discovered: these are *V. Coursii* S. Ball, and *V. myriophlebium* Bak. on the one hand, and this makes it possible to locate them with certainty in the group of UNIFLORES (Lejeunia, table IV). In *V. vohimavoense* S. Balle (cf. Flora of Madagascar, p. 90, fig. XI, 12-13) on the other hand, while having the same general appearance, the branches of the female plants are subcylindrical or tetragonal over most of their length and bear uniflorous cymules and those of male plants are almost entirely flattened with 3-flowered cymules, which places this species in the group of UNI-PLURIFLORES.

EXTENSION OF SPECIFIC LIMITS:

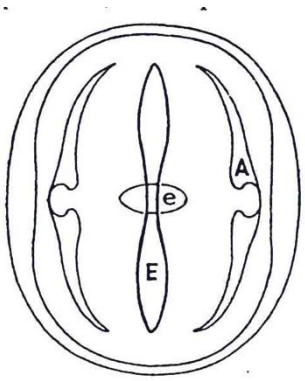
The meaning of 3 species has been slightly enlarged, due to the introduction of neighboring species synonymous with varieties:

V. cuneifolium Bak., The most widespread species of the Island, shows an amplitude of variations which allows to include, as varieties: *V. cryptophlebium* Bak., *V. demissum* H. Lec., And *V. lophiocladum* Bakl :. var. *subcylindricum*

Pollen of var. *lanceolalum*. Grains isopolar, longiaxial (P = 38 µ, E = 32 µ), tricolpate; ectoapertures narrowed at the equator; endoapertures elongated along the equator. Exine very thick at the equator (ca. thin ectexine, scabrous.

V. lophiocladum Bak., a species which differs from the preceding one by its flattened branches, now includes, in variety, *V. papillosum* H. Lec.

V. myriophlebium Bak., like *V. cuneifolium*, shows intense variability in the shape and dimensions of its leaves, not only over the extent of its growth, but sometimes on the same individual (cf. HUMBERT); this is what led to the inclusion of *flabellefolium* and *tetrapterum*.



Sketch showing both the shape of the apertures and the cut of the exine.
A – aperture seen from 3/4
E = ectoaperture
e = endoaperture.

CASE OF **V. triflorum** DC:

As it was shown in a work in the course of publication (6), this species has a remarkable distribution, compared to those of the other Loranthaceae of Africa: one finds it on all the Eastern part of the Continent, in San Tomé (?) and in the Archipelagos neighboring Madagascar, but it does not seem that it exists on the Big Island, where it would have been replaced by others very close; it is characterized essentially by mixed 3-flowered and unisexual inflorescences, but to these are added, beyond some other type (inflorescences with ± large number of flowers, cymules containing flowers of the 2 sexes variously arranged); we find, in Africa and Madagascar, plants whose aspect resembles that of *V. triflorum* and where it is another type of inflorescences which has become predominant or exclusive. In Madagascar we can consider *V. cuneifolium* as a dioecious *V. triflorum*, *V. radula* as a *V. triflorum* where the fruits remain warty and where sometimes the branches flatten out more and *V. tsiafajavonense* as a collateral of *V. triflorum* where 3 flowered mésandres cymules are the most numerous.

D. - **KORTHALSELLA** van Tiegh.

This genus, studied in detail by DANSER about twenty years ago (10) has been described and, illustrated in the Flora of Madagascar (p. 108, fig. XIV, 16-19); its distribution will only be indicated here in the neighboring Archipelagos, where one more variety of *K. opuntia* has been hatched in Madagascar.

1. **K. opuntia** (Thunb.) Merr. var. Bojeri (van Tiegh.) In. (10).

Syn. : *Bifaria Rojeri* van Tiegh., Bull. Soc. Bot. Fr. 43:17 (1895).

Type: Bojer without number (holotype of B. Bojeri, K :); Mauritius. dark forests, on *Antidesma madagascariensis*.

This variety, the closest according to DANSER from the typical variety, is endemic to the Mascarenes and characterized by its smaller size, its less branching, its lower number of internodes which are more cylindrical, thicker and leathery, with or without 1-3 (5) slightly protruding ribs.

Distribution: MASCARENES: Mauritius: Mt Pouce, on *Antidesma madagascariensis* and *Nuxia* sp. (Boivin without number, Commerson sari, number and Vesco without number in 1849 in Herb. P) (Bowles without number and Carmichel without number in Herb. K); Rodriguez: on *Fernelia* sp. (Balfour without number and, Duncan without number in herb. K) (Jauffret without number in herb. I Maurice).

2. **K. opuntia** var. **Gaudichaudii** (van Tiegh.) Dans. (Ibid.).

Type: Gaudichaud s. number in 1837 (holotype P); I. de la Réunion.

Characteristics and bibliography: cf. Flora of Madagascar p.

Distribution: MASCARENES: Mauritius: Mt Pouce, with var. *Bojeri*, on the same hosts and on *Eugenia cotinifolia* Bijoux without number and Boivin without number in herb. P); Rodriguez: on *Fernelia buxifolia* (Balfour without number in herb. P); Reunion: on *Jossia* sp., *Jossia buxifolia*, *Prockia* sp., and *Xanthophyllum* sp. (Commerson without number Frappier 335; ISLE without number; Moricand without number; Richard 497 and 779 in herb. P). - SEYCHELLES, MADAGASCAR, COMOROS and ETHIOPIA.

K. opuntia var. **Richardii** (van Tiegh.) Dans. (Ibid.).

Type: Richard 218 (holotype of B. Richardii in herb. K).

Characteristics and bibliography: cf. Flora of Madagascar, p. 114.

Distribution: MASCARENES: Mauritius: Bois Maigre, on *Nuxia verticillata* (Bory without number in herb. P; Ph. Ayres without number in herb K; Vaughan 1350 and Dep. Agric. Without number in herb. Mauritius): Reunion: Bois à Salasis, Hauts du Buton, mountain forests, Hellbour around 1300 m alt. on *Nuxia verticillata* and *Prockia* (Armance without number, Boivin 1286. Commerson without number, Delessert without number, Richard without number and Vieillard without number in herb . P; Boivin without number: Bojer without number and Carmichael without number in herb. K); Lam et Meeuse 5216 (herb. P and K); Rodriguez: on *Fernelia* sp. (Duncan 94 in herb.)

-? SECHELLES, on *Sideroxylon* sp. (Horne 574 in herb. K) - MADAGASCAR.

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Footnotes by original page; here renumbered consecutively.

105. 1. Considered as a family by Maheshwari and Johri (20): see Bibliography.
108. 2. In particular *T. notothixoides* (Hance) Dans. et *pulverulenta* (Wall.) In.
115. 3. Little is known about adult flowers.
116. 4. = *Hibiscus* or *Givotia* (Humbert).
117. 5. There are intermediaries with buds ± widely winged (and) flowers with 4 petals.
118. 6. See *Agelanthus*, *Englerina*, *Phragmanthera* and *Tapinanthus*.
7. Where it is known only for the genera *Plicopetalus* [= *Plicosepalus*] (3 sp.), *Tapinostemma* [=*Plicosepalus*] (3 sp.) and, only certain races of *Globimetula Braunii* and *Phragmanthera capitata*.
120. 8. *Bakerella clavata, hoyifolia, Perrieri, Poissonii, tricostata* and *Viguieri*.
124. 9. The following points in Table V of Webbia should be corrected with regard to the morphological characters attributed to the genus *Bakerella* (a) corolla lobes never revolute; b) inflorescences unifloral, original character, deserving 4 points; e) deciduous bracts and calyxes (idem b); d) connective never significantly enlarged. This brings the evolutionary level of the genus to 31 points.
126. 10. It should be noted that in Figure 14 of Webbia the diagram of the *Bakerella* shows the presence of hair on the flowers, which is not the case for any of the species, contrary to what is indicated the original description of *Loranthus griseus* (= *Bakerella grisea*).
133. 11. The coiled filaments are found in 14 continental genera and 7 of them have, at least in some of their species, an apical tooth on the filament.
134. 12. With some exceptions (*Globimetula*, *Odontella* [=*Oncocalyx*], and *Spragueanella*) in Africa.
135. 13. The photos were taken at the Palynology laboratory of the Museum, under the direction of Mrs. VAN CAMPO.
137. 14. That the collector does not specify; his specimen is devoid of fruit.

Pl. 1. – Distribution of the 4 genera of Malagasy Loranthaceae : *Bakerella*, 16 sp. : Madagascar and coastal islands, 16 sp .; Comoros, 1 var. of *B. clavata*; Mascarenes, 1 ssp. endemic, *B. hoyifolia*; Seychelles, 1 ssp. endemic, *B. clavata*. *Socratina*: Madagascar, 2 sp. endemic. - *Viscum*, approx. 75 sp. : Madagascar and Coastal Islands, 29 sp .; Comoros, 1 sp. from continental Africa and the Archipelagos; Mascarenes, 1 sp. orientale in Mauritius and 1 sp. from continental Africa and Archipelagos in Reunion; Seychelles, 1 sp. from continental Africa and the Archipelagos; Continental Africa, approx. 30 sp. and 1 sp. Archipelagos; Asia, approx. 18 sp.; Oceania, approx. 6 sp. - *Korthalsella*, approx. 20 sp. including 1 common to all of the following regions: Madagascar and coastal islands (2 more endemic sp.); Comoros, Mascarenes and Seychelles; Continental Africa; Asia (1 sp. More); Oceania (19 plus sp.).

Pl. 2. – 1, bud of *Bakerella clavata* ssp. *sechellensis* × 5 (Horme 571); 2, sheet of the previous × ½: 3, leaf of *B. hoyifolia* ssp. *Bojeri* × ½ (Buoton s. no): 4, previous bud × 5: 5, upper part of the flower of *B. microcuspis* × 5 (Baron 20); 6, id. *B. Poissonii* var. *Poissonii* × 5: Herb. Res. Nat. Madag. 5186); 7, corolla of *B. clavata* var. *Baronii* × 5 (Baron 20).

Pl. 3. – 1, haustoria of *Bakerella tricostata* x 1/3 (Poisson 245); r, branching of the host. - 2, id. back; a, anastomosis between two parts of a creeping axis. - 3, the haustoria of *B. Viguieri* var. *marojejensis* x 1/3 (Perrier de la Bâth 16470). - 4, id. back. - 5, transverse section of the end of the branch of the host of *B. tricostata* at the level of a secondary haustorium x 3.3; h, exploded bark and host wood; p, wood, starchy tissue and sclerotic strands (in black) of the parasite. - 6, gall with circular orifices, at the end of a creeping axis of *B. Viguieri* var. *marojejensis* x 4/3. - 7, detail of 4 showing a branching of the parasite inside the wood of the host; in black the sclerotic cord of the *Bakerella* x 3.3.

Pl. 4. – 1, cross section of branch of *Bakerella gonoclada* branch × 25 (Baron 2901; 2, sclerotia isolated from the bark of the previous × 100; 3, leaf sclereid of *B. hoyifolia* × 100 (Preparation of van Tieghem); 4, id. *B. Poissonii* var. *alata* × 100 (Strike 1); 5, isolated sclereid from receptacle of *B. grisea* × 100 (Decary 4 829); 6, nodules of petal sclereids of the same; 7, subepidermal foliar sclereids of *B. Poissonii* var. *Poissonii* × 100 (Herb. Res. Nat. Madag. 5 186): 8, subpidermal foliar sclereids of *B. diplocrater* × 100 (Humblot 47); 9, foliar sclereids of the same × 100; 10, leaf sclereids of *B. microcuspis* × 100 (Preparation of van Tieghem): 11, id. *B. Poissonii* var. *alata* × 100 (Grève 1); 12, id. *B. ambongoensis* × 100 (Hildebrandt 3 056); 13, median longitudinal section of receptacle of *B. clavata* var. *aldabrensis* × 6 (Hildebrandt 3 699); 14, cross section of leaf blade of *B. hoyifolia* × 25 (Preparation of van Tieghem); 15, cross section of petiole of *B. diplocrater* 25 (Humblot 47).

Pl. 5. – Supposed evolution of the genus from the presumed Ancestor (in bold, the species; the subspecies and varieties in underlined characters).

Pl. 6. – Distribution of the 16 species of *Bakerella* in Madagascar: ● and ■ typical varieties. ▲: varieties with 5-winged apical bulge; × □ other varieties.

Pl. 7. – External hairs of the corolla: 1-3, *Socratina Keraudreniana*; 4-6, *S. bemarivensis*. - Internal hairs of lobes; 7, *S. Keraudreniana*; 8-9, *S. bemarivensis* (all × 100). - 13, cross section of branch of *S. bemarivensis* × 25. - 14, median longitudinal section of flowering receptacle of *S.*

Keraudreniana, approx. × 16. - Leaves *of S. Keraudreniana* × 1 (Leandri 4034): 15, normal; 16, bearing aecia but not deformed; 17, deformed but devoid of aecia; 18, distorted and bearing aecia. - 19, cross section of petiole of *S. Keraudreniana* × 25. - 20, fragment of transverse section of blade of *S. Keraudreniana* × 25. (All according to types except 15 to 18).

P1. 8. – *Socratina Keraudreniana* on the limestone plateau around Tuléar. (Photo M. KERAUDREN.)

Pl. 9. – Pollen of *Socratina Keraudreniana* S. Ball × 1000 (Humbert 19902): 1, polar view; 2, cutting of the exine in the thickening; 3, polar view developed on the groove; 4, meridian view, couple in the two subpolar thickenings; 5, exine; 6, regular meridian view. – a = thickening of exine.

Plate 1

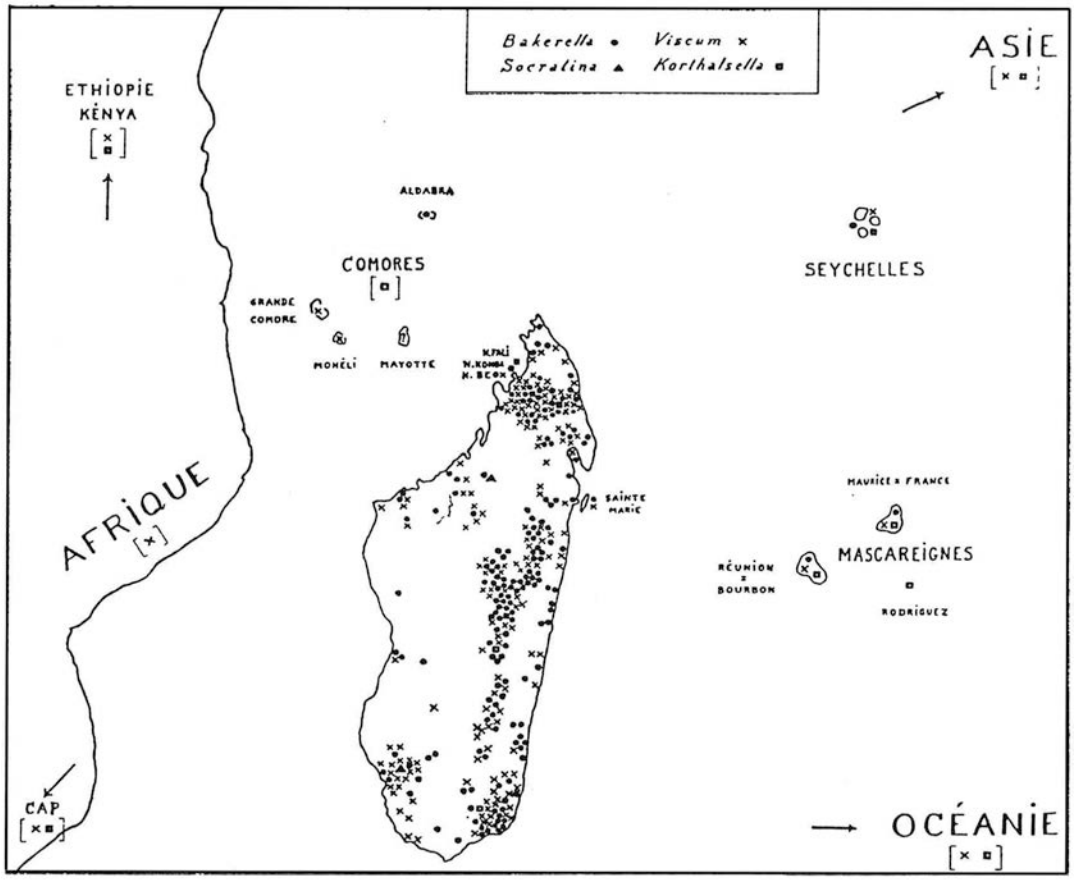
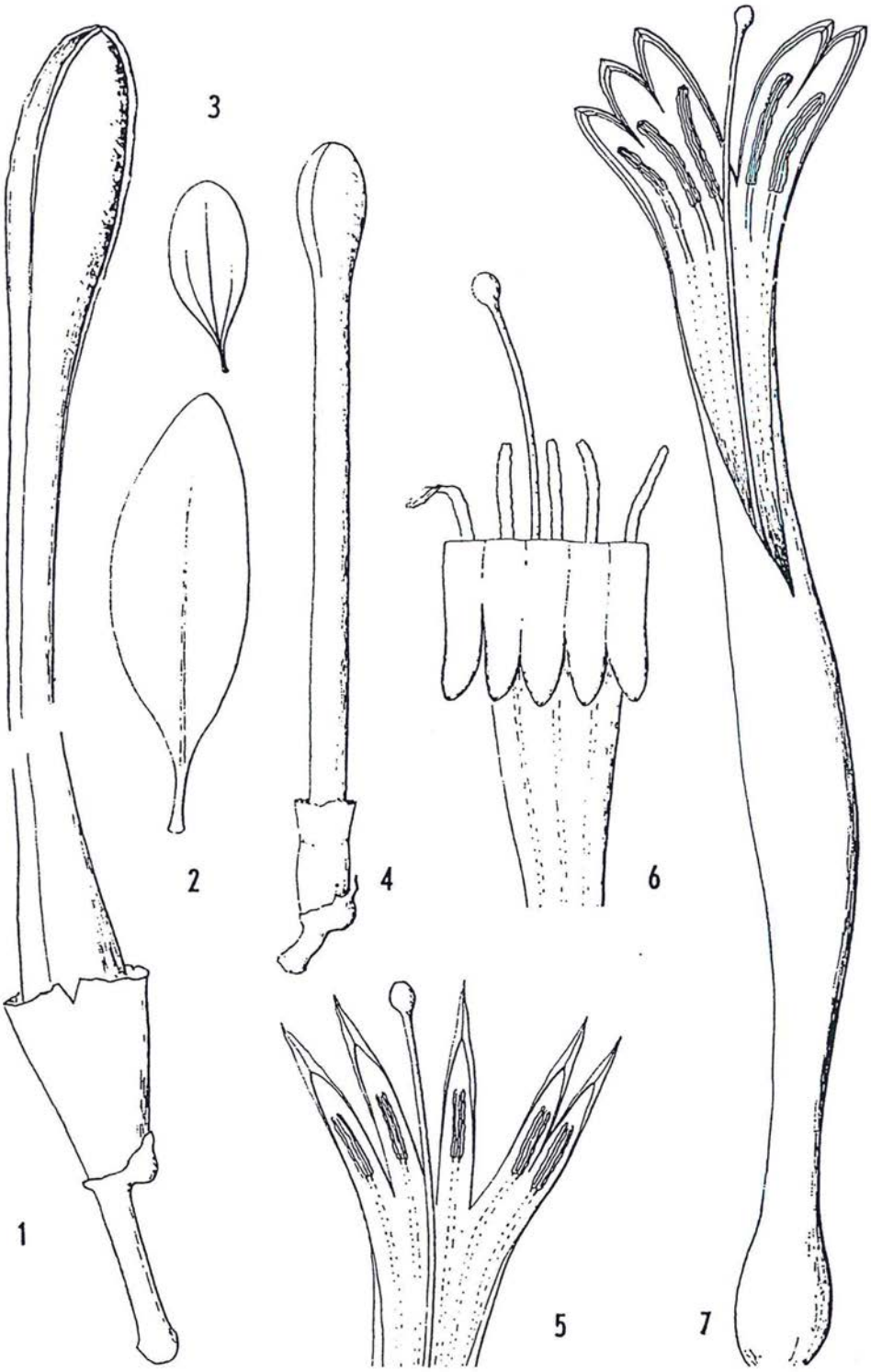

Bakerella
Viscum
Socratina
Korthalsella
ASIE
ETHIOPIE
KENYA
ALDABRA
COMORES
SEYCHELLES
GRANDE COMORE
MOHÉLI
MAYOTTE
NOSSI
N.KOMBA
M. BOU
SAINTE MARIE
MAURICE
FRANCE
AFRIQUE
RÉUNION
BOURBON
MASCAREIGNES
RODRIGUEZ
CAP
OCÉANIE

Plate 2



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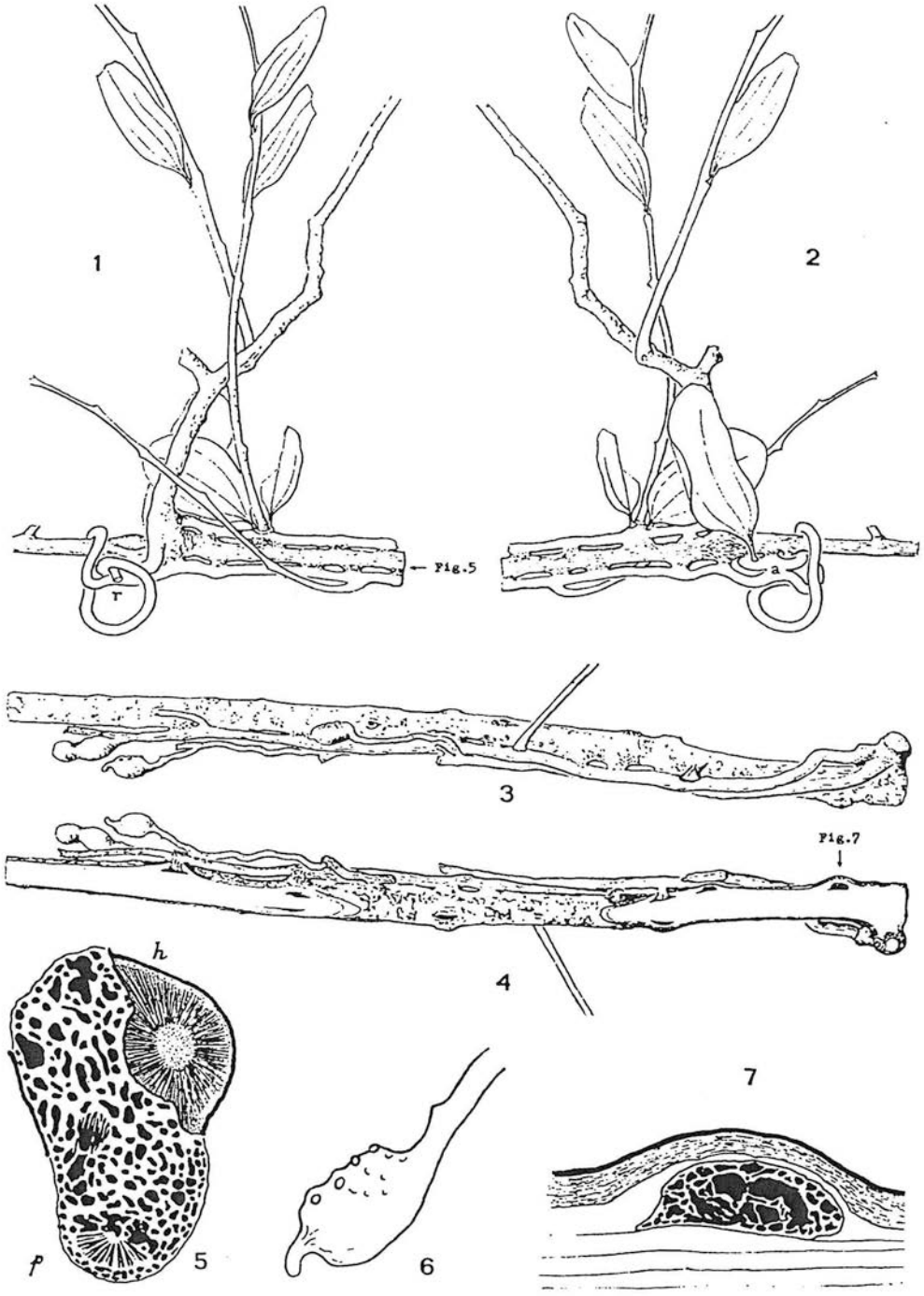

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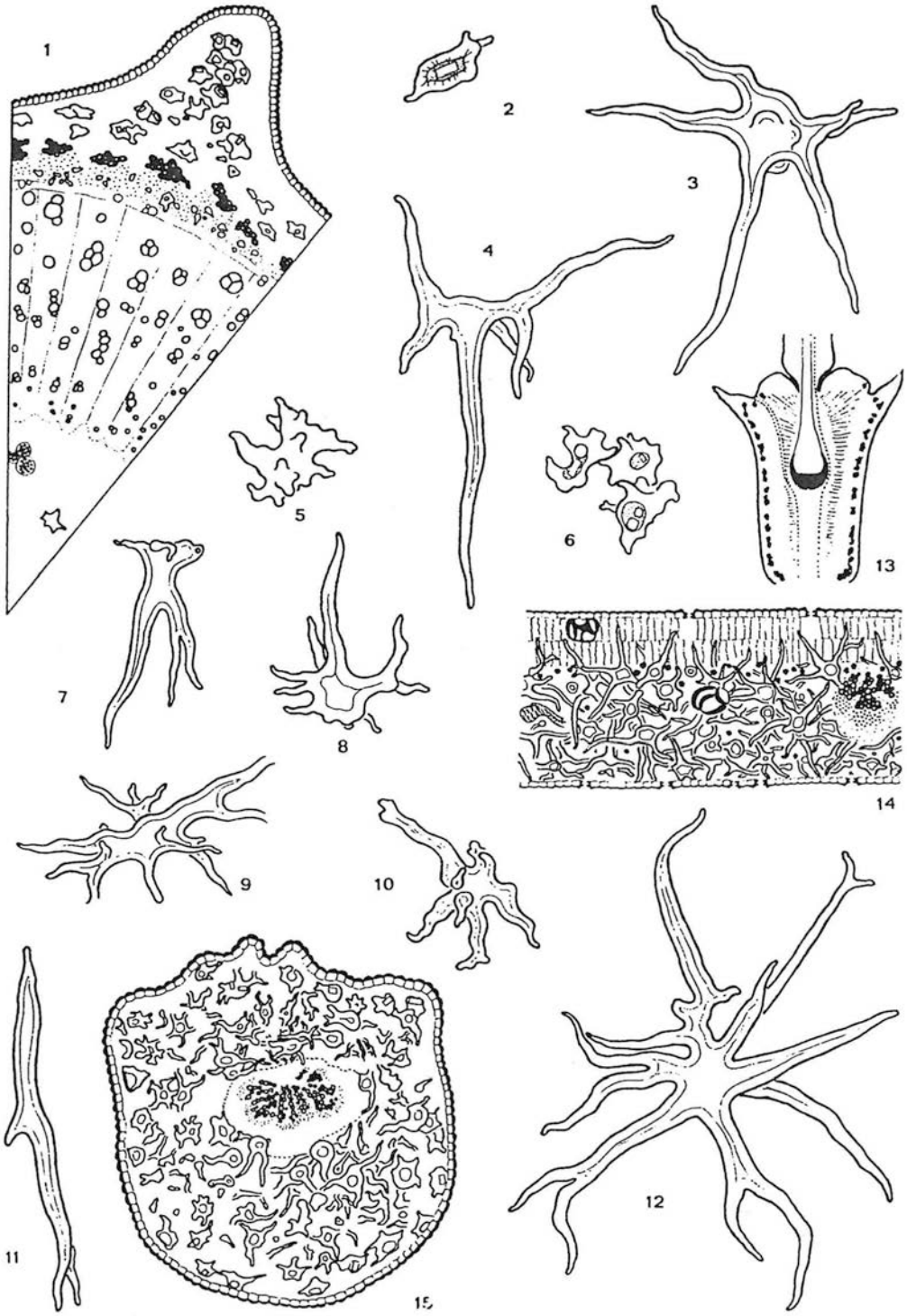

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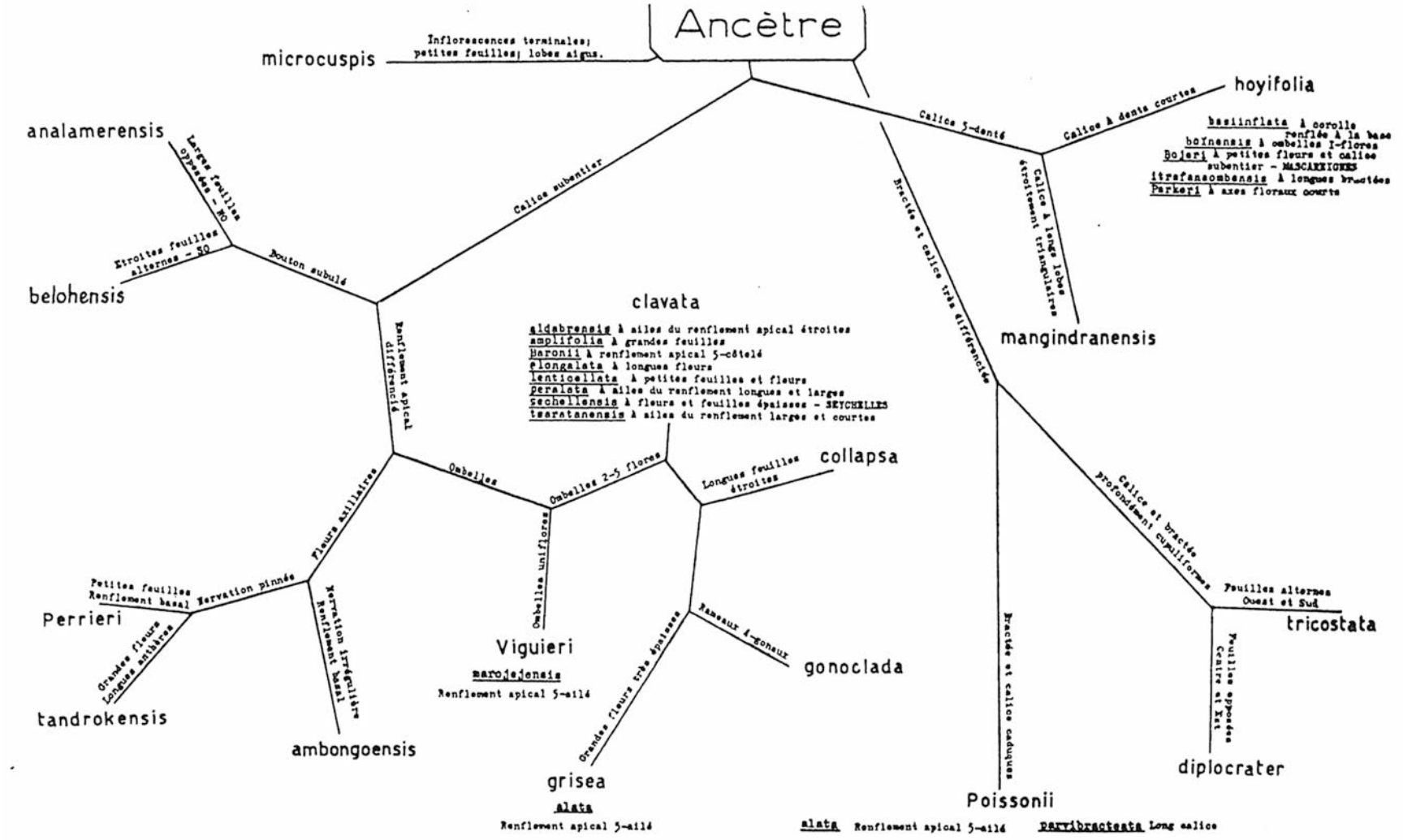
Ancètre
microcuspis
Inflorescences terminales; petites feuilles; lobes aigus.
hoyifolia
Calice 5-denté
Calice à dents courtes
basiinflata à corolle renflée à la base
boïnensis à ombelles 1-flores
Bojeri à petites fleurs et calice subentier - MASCAREIGNES
itrafanaombensis à longues bractées
Perkeri à axes floraux courts
analamerensis
Larges feuilles opposées - NO
Etroites feuilles alternes - SO
belohensis
Bouton subulé
Calice subentier
Renflement apical différencié
clavata
aldabrensis à ailes du renflement apical étroites
amplifolia à grandes feuilles
Baronii à renflement apical 5-côtelé
elongata à longues fleurs
lenticellata à petites feuilles et fleurs
peralata à ailes du renflement longues et larges
sechellensis à fleurs et feuilles épaisses - SEYCHELLES
tsaratanensis à ailes du renflement larges et courtes
Bractée et calice très différenciés
Calice à longs lobes étroitement triangulaires
mangindranensis
Ombelles
Ombelles 2-5 flores
collapsa
Longues feuilles étroites
Fleurs axillaires
Petites feuilles
Renflement basal
Nervation pinnée
Perrieri
Grandes fleurs
Longues anthères
tandrokensis
Nervation irrégulière
Renflement basal
ambongoensis
Ombelles uniflores
Viguieri
marojejensis
Renflement apical 5-ailé
Rameaux 4-gonaux
gonoclada
Grandes fleurs très épaisses
grisea
alata
Renflement apical 5-ailé
Bractée et calice caduques
Poissonii
alata Renflement apical 5-ailé
parvibracteata Long calice
Calice et bractée profondément cupuliformes
Feuilles alternes Ouest et Sud
tricostata
Feuilles opposées Centre et Est
diplocrater

Plate 6

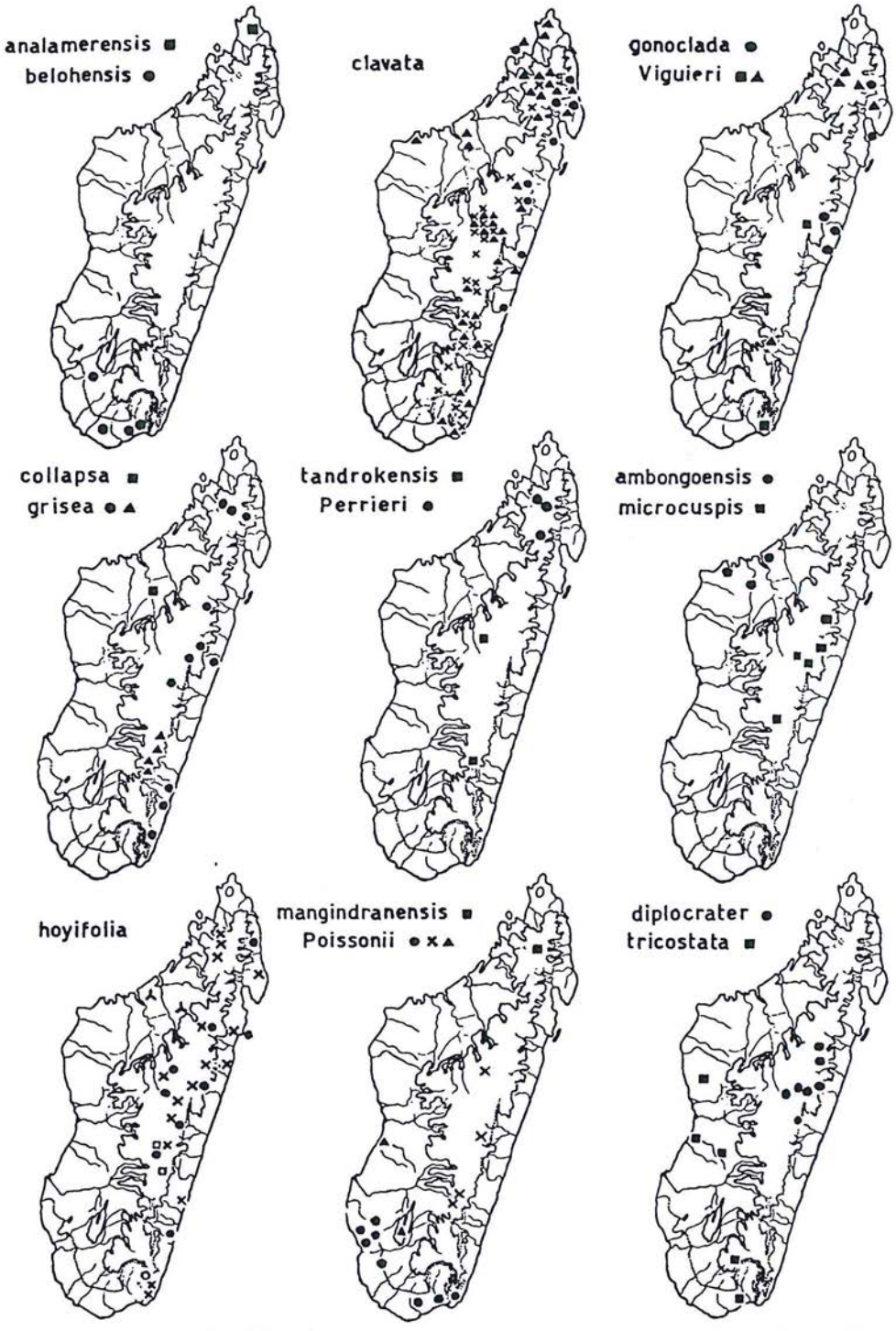
analamerensis ■
belohensis ●
clavata
gonoclada ●
Viguieri ■▲
collapsa ■
grisea ●▲
tandrokensis ■
Perrieri ●
ambongoensis ●
microcuspis ■
hoyifolia
mangindranensis ■
Poissonii ●×▲
diplocrater ●
tricostata ■

Plate 7

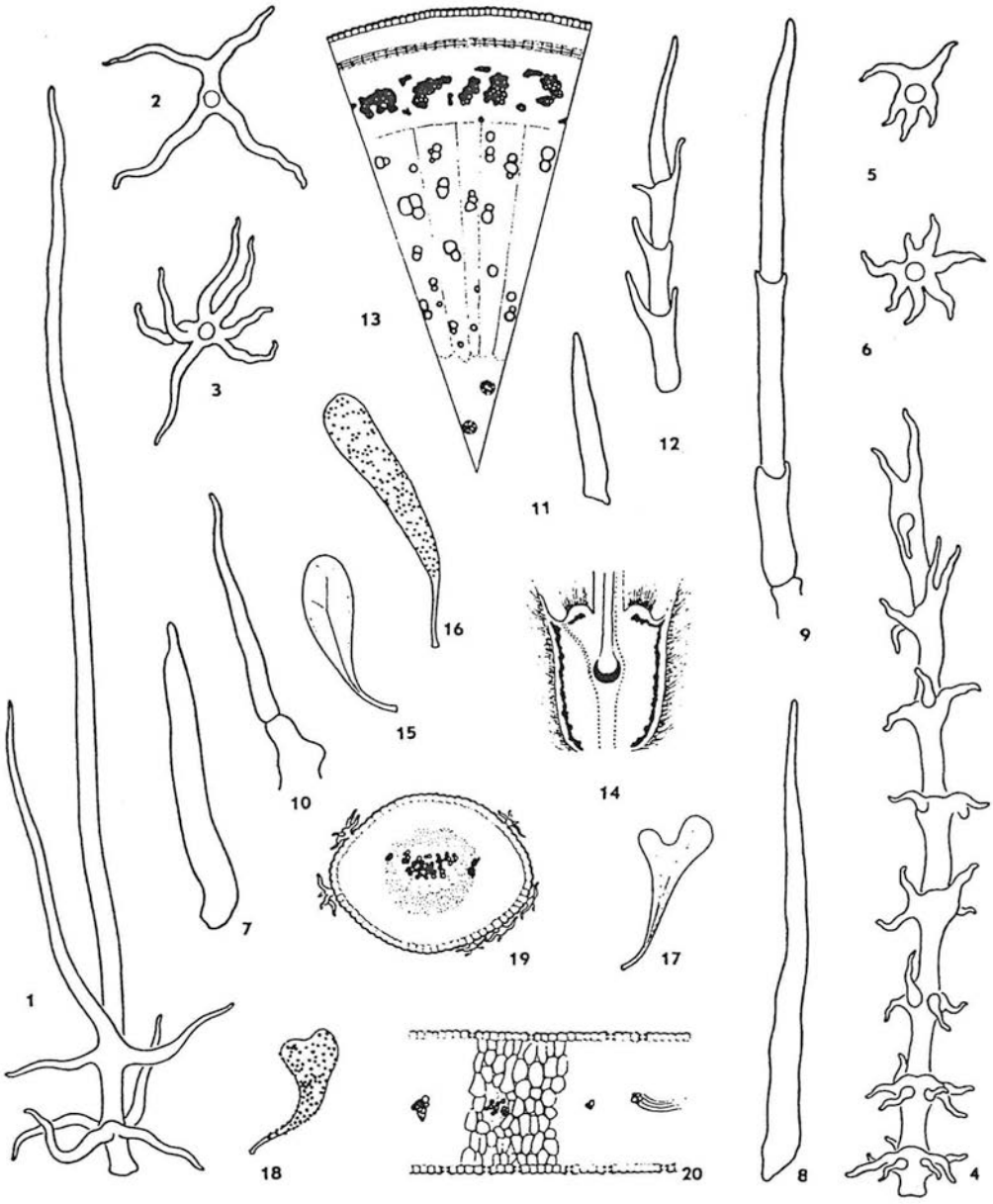

Plate 8

Plate 9