

# The flora of New Caledonia's calcareous substrates

**Philippe MORAT**

Laboratoire de Phanérogamie, Muséum national d'Histoire naturelle,  
16 rue Buffon, 75005 Paris, France.  
morat@mnhn.fr.

**Tanguy JAFFRÉ & Jean-Marie VEILLON**

Laboratoire de Botanique et Écologie Appliquées, I.R.D.,  
BP A5, Nouméa, Nouvelle-Calédonie.  
tanguy.jaffre@noumea.ird.nc

## ABSTRACT

Calcareous substrates occupy c. 3,800 km<sup>2</sup> in New Caledonia (incl. 1,990 km<sup>2</sup> in the Loyalty Islands) and are of various age and origin. A total of 488 spp. (16.1% of the total indigenous seed plants) grow on these substrates, 39.7% of which are endemic, far below the 76,9% level of the total flora. Among these, 401 spp. are merely tolerant of calcium, with a wide enough ecological amplitude to occupy other substrates, including 200 spp. that also grow on otherwise highly selective ultramafic soils. Only a core of 87 spp. are restricted to calcareous substrates and can truly be called calciphilous. They grow mainly in sclerophyllous and dense forests. The affinities and origins of this flora are analyzed and show stronger links with Australia and Malesia, a result largely similar to those obtained for the floras as a whole. Many threatened taxa are part of this flora, and require special measures to ensure their protection.

## KEY WORDS

calcareous substrates,  
flora,  
New Caledonia.

## RÉSUMÉ

*La flore des substrats calcaires de la Nouvelle-Calédonie.*

Les substrats calcaires d'âge et d'origine diverses occupent en Nouvelle-Calédonie une surface d'environ 3800 km<sup>2</sup> dont 1990 aux îles Loyauté. Au total, 488 espèces (16,1 % de la flore phanérogamique) croissent sur ces substrats avec un endémisme spécifique de 39,7 % nettement moins élevé que celui de la flore globale (76,9 %). Parmi ces espèces, 401 sont de large amplitude écologique et suffisamment tolérantes pour supporter d'autres types de substrats, dont 200 se retrouvent sur des sols issus de roches ultramafiques de composition chimique pourtant très sélective. Seul un lot de 87 espèces strictement inféodées au calcaire mérite d'être appelées calciphiles ; elles poussent essentiellement en forêts sclérophylles ou en forêts denses humides. Les affinités et les origines de cette flore sont discutées et montrent des liens plus

**MOTS CLÉS**  
substrats calcaires,  
flore,  
Nouvelle-Calédonie.

marqués avec l'Australie et la Malésie, presque similaires à ceux déjà obtenus pour l'ensemble de la flore néo-calédonienne. De nombreux taxons menacés nécessitant des mesures spéciales de protection sont présents dans cette flore calciphile.

## INTRODUCTION

The range of rock types in New Caledonia is, along with its long isolation (separated from Australia since the end of the Cretaceous, some 65 million years ago), one of the fundamental causes of the exceptional richness of the territory's flora (3,021 native species of flowering plants), as well as its uniqueness (76,9% of those species endemic), and all this despite the small size of the territory (19,100 sq. km, of which the main island of New Caledonia itself comprises 16,900 sq. km) (MORAT et al. 1981).

Although the role of certain substrates, such as ultramafics, in influencing the uniqueness and distribution of the New Caledonian flora and vegetation types has been much studied (MORAT et al. 1984, 1986; JAFFRÉ 1976, 1980; JAFFRÉ et al. 1984), that of the calcareous rocks is so far little understood.

## MATERIAL AND METHODS

Calcareous substrates outcrop in various places in the territory (Fig. 1) and cover some 3,800 sq. km., of which nearly 2,000 sq. km are in the Loyalty Islands and on the Ile des Pins. They can be divided into two major categories: those derived from coral reefs and those of sedimentary origin (PARIS 1981a, 1981b). The latter are of diverse ages and have varying appearances. The oldest, dating from the Paleocene to the Lower Eocene, occur in the Hienghène and Koumac areas as well as on the west coast as far south as Bourail; in some places they are found as limestone pavement (karst lapiazé) (Fig. 2). Slightly younger calcareous substrates (Middle to Upper Eocene) occur sporadically along the west coast, between Poum and Nouméa (Nouméa-Boulouparis valley, Baie de St. Vincent, Poya), and in the centre of the main island (Table Unio, Col des Roussettes) as calcified

flysh, or they are associated with siliceous rocks (phtanites). In the Népoui area they are found in conglomerates dating from the Miocene.

In certain places, calcareous rocks have been covered over by alluvial deposits derived from older ultramafic rocks (Népoui, Pindai, Pouembout forest): as a consequence they are very magnesium-rich. In the majority of cases, however, the characteristic features caused by the incorporation of the ultramafic material do not over-ride those of the underlying calcareous substrates, which produce soils rich in phosphorus and calcium.

Those of coral reef origin (Fig. 3) occur in the Loyalty Islands (including Walpole), the Ile des Pins and along the coastal strip in the south-east of the main island. They are of Miocene origin and emerged in the Quaternary.

Only a detailed study of the flora growing on calcareous soils, and particularly an analysis of the distribution of its species on all the other substrates found in the territory, can reveal whether there exists in New Caledonia a truly obligate calciphilous flora as found elsewhere (e.g. Madagascar), or whether it is a flora merely tolerant of calcium.

For this study, only indigenous species are taken into consideration. The others, both naturalized or subsponaneous, being by definition alien (and whose ecology may be different in their native habitats), cannot, logically, belong to the indigenous assemblage of New Caledonian calcicolous plants. So that the results can be compared with those from earlier work (MORAT et al. 1984, 1986, 1994; JAFFRÉ et al. 1987) relating to vegetation types on other geological substrates (ultramafic rocks), only seed-plants are considered here.

## RESULTS AND DISCUSSION

### 1. Flora of calcareous substrates

As defined here, the indigenous seed-plant flora growing on calcareous substrates comprises

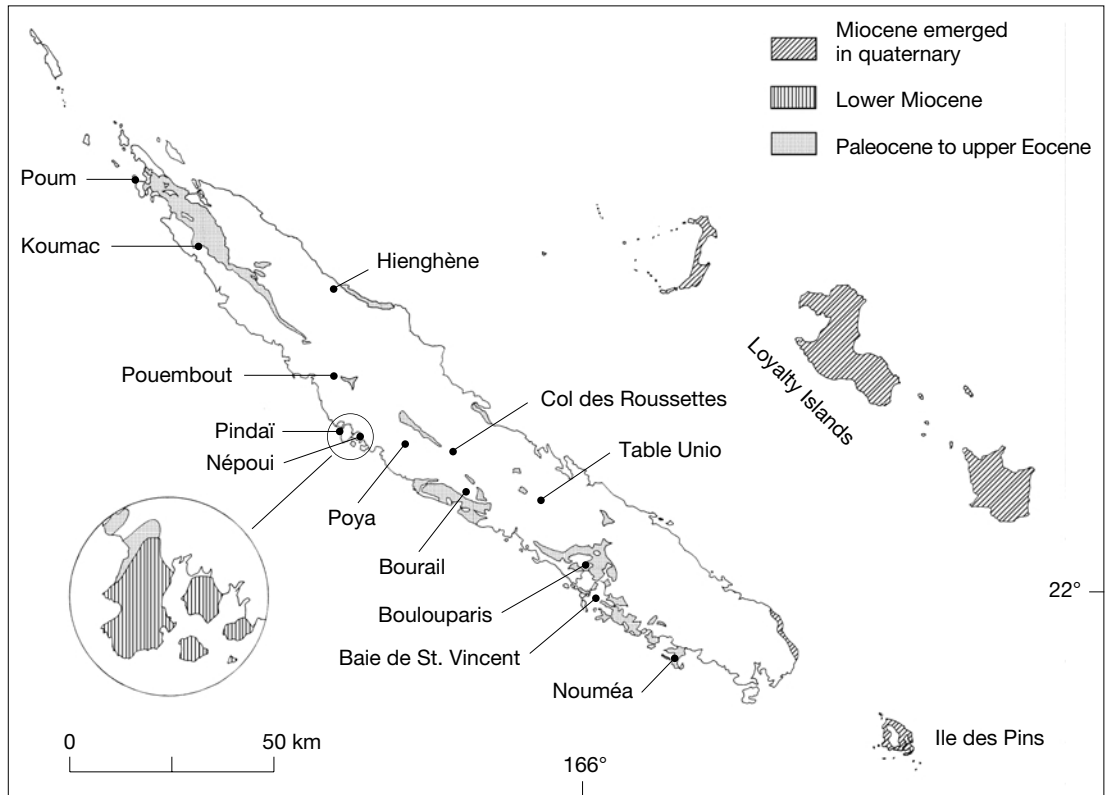


Fig. 1. — Limestone substrate in New Caledonia (adapted from PARIS 1981).

488 species, representing 311 genera in 97 families (Table 1). Comparison with the entire indigenous flora shows that the flora of calcareous substrates is relatively poor, comprising only 16.1% of the total, and has a lower level of endemism, with only 39.7% of its species restricted to the territory, compared with 76.9% of the entire flora.

This relative paucity could be due in part to the smaller area occupied by these substrates, about 3,800 sq. km, and partly to human interference, which has considerably degraded and reduced the original vegetation, as well as to the currently incomplete state of the floristic inventory of the vegetation types that occur on calcareous rocks. When compared with the entire New Caledonian flora, that of calcareous areas seems, on the other hand, to be more diversified at the family and generic levels, rather than at the level of species. Thus 43% of the genera and 59% of

the families, compared with just 16.1% of the species represented in the New Caledonian flora, are found on these substrates.

A single family (Euphorbiaceae) has 36 species, although the number decreases rapidly (Table 2): the thirteenth family (Compositae), for example, has only ten. At the family level, there are certain gaps that are worth pointing out. Most of the families of gymnosperms (with the exception of one species each of *Cycas* and *Araucaria*), all the endemic families (with the exception of *Phelline comosa*) and several families, primitive (Winteraceae, Monimiaceae) and not (Epacridaceae, Cunoniaceae), are absent from calcareous substrates. Moreover, certain families very commonly occurring elsewhere [Liliaceae, Orchidaceae, Palmae, Pandanaceae, Asclepiadaceae, Myrtaceae (especially Myrtoideae), Cyperaceae, Dilleniaceae, Flacourtiaceae and even Capparaceae]

TABLE 1. — Comparison of the indigenous calcareous flora with the entire indigenous phanerogamic flora.

	Species			Genera			Families		
	Number	Endemic	%	Number	Endemic	%	Number	Endemic	%
Entire flora	3,021	2,326	76.9	723	98	13.5	165	5	3
Calcareous flora	488	194	39.7	311	10	3	97	1	< 1
%	16.1			43			59		

TABLE 2. — Largest families in the calcareous flora.

Family	Number of species
Euphorbiaceae	36
Gramineae	33
Leguminosae	28
Myrtaceae	22
Sapindaceae	22
Apocynaceae	19
Rubiaceae	19
Cyperaceae	17
Convolvulaceae	14
Rutaceae	12
Ebenaceae	11
Moraceae	11
Compositae	10

TABLE 3. — Largest genera in the calcareous flora.

Genus	Number of species
<i>Diospyros</i>	11
<i>Phyllanthus</i>	9
<i>Ficus</i>	8
<i>Syzygium</i>	8
<i>Myoporum</i>	7
<i>Ipomoea</i>	6
<i>Euphorbia</i>	5
<i>Oxera</i>	5
<i>Austromyrtus</i>	5
<i>Arytera</i>	5
<i>Cupaniopsis</i>	5

are very poorly represented on this type of substrate.

In view of the above mentioned diversification at the generic level (Table 3), it is not surprising that few genera are rich in species. The largest genus (*Diospyros*) has only 11 species here, against 29 for the total flora, while the next five genera (*Oxera*, *Austromyrtus*, *Euphorbia*, *Arytera* and *Cupaniopsis*) have only five species each against 5, 22, 26, 7 and 30 species respectively for these genera in New Caledonia as a whole. Curiously the five known species of New Caledonian *Euphorbia* are all found on calcareous substrate.

## 2. Vegetation types

The primary vegetation types on calcareous rocks are varied but are essentially referable to tropical rain forest as manifest on calcareous soils or in coastal areas (Ile des Pins, Loyalty Islands, Hienghène, Koumac), or to sclerophyll forest, dune or behind dune formations, and also areas

behind mangroves. But these original vegetation types have in many cases (notably sclerophyll forest) suffered damage through human activity and have as a result been replaced by secondary formations (secondary forest, savanna, thickets, weedy vegetation) in which an alien flora of cosmopolitan species thrives.

Species of the calcareous flora are distributed in different primary and secondary vegetation types (Table 4). Their distribution shows an equal share of species between sclerophyll forest, rain forest and secondarised vegetation (thickets, savannas, weedy vegetation), with a high rate of endemism for the two forest types (115 and 117 species respectively) and low endemism (65 species) for anthropogenic vegetation, which is scarcely surprising. However, many of the species included in these figures are also found in several vegetation types. Therefore, to refine this analysis it is preferable to indicate which of the species mentioned are strictly confined to each vegetation type (Table 5). If the results show us nearly an equal share of species between them,



Fig. 2. — Limestone pavement: Koumac.



Fig. 3. — Calcareous substrate derived from coral reefs: Ile des Pins.

the preponderance of endemic calcareous species in rain forest (52), followed by sclerophyll forest (34), which represents a significant level of endemism, is unambiguous.

### 3. Calciphilous flora

The 488 species so far counted in the calcareous flora are by definition tolerant of calcium. The majority (401) have a rather broad ecological amplitude in that (Table 6) they are also found on other substrates (UC, CA, UCA), where perhaps they originated. They include 200 species growing on ultramafic soils (UC, UCA), which sometimes overlie limestone. Only a core of 87 species representing 70 genera in 38 families can truly be called calciphilous in that they are found nowhere but on calcareous substrates.

The endemism in this group is shown in Table 7. Of the 87 calciphilous species, 42 are endemic and include (Table 8) some outstanding taxa such as:

— *Cyrtandra mareensis* (Gesneriaceae), which is the only New Caledonian representative of a widespread Pacific genus;

TABLE 4. — Distribution of the calcareous flora (species) according to vegetation type.

Vegetation type	Total number of species	Endemic species
Sclerophyll forest (L)	230	115
Tropical rain forest (F)	223	117
Dune and behind dunes (P)	150	15
Damaged and other vegetation types (N)	258	65

TABLE 5. — Distribution of the calcareous flora strictly limited to an individual vegetation type.

Vegetation type	Total number of species	Endemic species
Tropical rainforest (F)	76	52
Sclerophyll forest (L)	65	34
Dunes and behind dunes (P)	74	8
Secondary and other vegetation types (N)	74	6

TABLE 6. — Distribution of species of the calcareous flora according to substrate: **C**, species restricted to calcareous substrates; **UC**, species found on both calcareous and ultramafic rocks; **CA**, species found on both calcareous and other substrates but not on ultramafic rocks; **UCA**, species found on all substrates types.

	C	UC	CA	UCA	Total
Number of species	87	29	200	172	488
Endemic species	42	20	61	71	194

— *Lepturopetium kuniense* (Gramineae), a rare species typical of raised coral reefs and belonging to a bispecific Pacific genus described from New Caledonia but with a very disjunct distribution reaching from the Marshall Islands in the North East to Cocos Island west of Australia in the Indian Ocean;

— *Lipochaeta lifuana* (Compositae) whose 20 congeners are restricted to Hawaii;

— *Cyphophoenix nucele*, the only endemic New Caledonian species of palm occurring outside of the Grande Terre.

TABLE 7. — The strictly calciphilous flora.

	Species (C)	Genera with at least one calciphilous species	Families with at least one calciphilous species
Total	87	70	38
Endemic	42	4	0

Of the 70 genera (Table 7) represented on calcareous substrates, only four are endemic: *Cyphophoenix*, *Podonephelium*, *Leptostylis* and *Acropogon*. Of the non-endemic genera, however some have a very restricted distribution, limited to one or two phytogeographical areas: outside New Caledonia, *Lipochaeta* is only found in Hawaii, *Cyclophyllum* in Vanuatu and Fiji, and *Lepturopetium* in the northern tropical Pacific and Malesia. The affinities of the calcareous flora must be sought from the 87 calciphilous species. As in similar works on other substrates, it is the genus (here 70 in number, four endemic) which is used to assess affinities. By analysing the 70 genera shared by New Caledonia and one of the other phytogeographic areas considered (previously defined by MORAT et al. 1984) and then two, three, four, five and six territories, respectively, we see that only 13 of them have a distribution restricted to 1, 2, 4, 5 or 6 phytogeographical areas outside New Caledonia (Table 9). All the others (58 in total) have a wide distribution: pan-Pacific, palaeotropical, or pantropical or even cosmopolitan!

By assigning to each of the different territories a coefficient proportional to the number of genera common to that territory and New Caledonia and inversely proportional to the total number of territories in which each of the genera occurs — as in earlier similar works (MORAT et al. 1986; JAFFRÉ et al. 1993; MORAT 1993) — the strongest affinities appear to be with Australia and Malesia (Table 10), which clearly dominate (with coefficients respectively of 2.56 and 2.27), a finding which is congruent with results obtained for the flora as a whole. Very surprising is the appearance of the northern tropical Pacific (including Hawaii) in third position, even above Vanuatu and the Solomon Islands, not to speak

TABLE 8. — Endemic calciphilous species.

<b>Alangiaceae</b>	<i>Alangium</i> sp., Veillon 7836 <i>Alangium</i> sp., Veillon 8050	<b>Mimosaceae</b>	<i>Serianthes lifouensis</i> (Fosberg) Nielsen
<b>Apocynaceae</b>	<i>Ochrosia inventorum</i> L. Allorge <i>Schefflera</i> sp., Veillon 7874	<b>Moraceae</b>	<i>Ficus lifouensis</i> Corner <i>Ficus mareensis</i> Warb.
<b>Araliaceae</b>	<i>Tieghemopanax crenatus</i> (Pancher & Sebert) comb. to be established	<b>Myrtaceae</b>	<i>Austromyrtus</i> sp., Jaffré & Rigault 2990 <i>Austromyrtus</i> sp., Veillon 6578 <i>Austromyrtus</i> sp., Veillon 6853 <i>Austromyrtus</i> sp., Veillon 7039 <i>Syzygium koumacense</i> J.W. Dawson <i>Syzygium pendulinum</i> J.W. Dawson <i>Cyphophoenix nucele</i> H. Moore
<b>Chenopodiaceae</b>	<i>Atriplex jubata</i> S. Moore	<b>Palmae</b>	
<b>Compositae</b>	<i>Lipochaeta lifuana</i> Hochr.	<b>Pittosporaceae</b>	<i>Pittosporum leroyanum</i> Tirel & Veillon <i>Pittosporum obovatum</i> Guillaumin <i>Pittosporum tanianum</i> Veillon & Tirel <i>Cyclophyllum tenuipes</i> Guillaumin <i>Randia sezitat</i> Guillaumin <i>Tarenna lifouana</i> (Däniker) Jérémie
<b>Ebenaceae</b>	<i>Diospyros inexplorata</i> F. White <i>Diospyros tridentata</i> F. White	<b>Rubiaceae</b>	<i>Podonephelium parvifolium</i> Radlk. <i>Leptostylis</i> sp., Veillon 6850 <i>Pichonia balansana</i> Pierre
<b>Euphorbiaceae</b>	<i>Acalypha pulchrespicata</i> Däniker <i>Cleidion lemorum</i> McPherson <i>Phyllanthus calcicola</i> M. Schmid <i>Phyllanthus ouveanus</i> Däniker <i>Phyllanthus pindaiensis</i> M. Schmid <i>Phyllanthus unifoliatus</i> M. Schmid	<b>Sapindaceae</b>	<i>Solanum insulaeapinorum</i> Heine
<b>Flacourtiaceae</b>	<i>Xylosma lifuanum</i> Guillaumin	<b>Sapotaceae</b>	<i>Acropogon</i> sp., Veillon 7830
<b>Gesneriaceae</b>	<i>Cyrtandra mareensis</i> Däniker		
<b>Gramineae</b>	<i>Lepturopetium kuniense</i> Morat		
<b>Labiatae</b>	<i>Oxera balansae</i> Dubard		
<b>Lauraceae</b>	<i>Cryptocarya schmidii</i> Kosterm.		

TABLE 9. — Genera with calciphilous species in New Caledonia otherwise found in fewer than seven other phytogeographical area. 1 indicates presence of the genus.

	Africa	Asia	Malesia	New Guinea	Australia	Solomons	Vanuatu	Lord Howe	Norfolk	New Zealand	Fiji	North Pacific	Polynesia	Samoa Tonga	Americas
<i>Lipochaeta</i>															
<i>Einadia</i>					1					1		1			
<i>Lepturopetium</i>			1									1			
<i>Austromyrtus</i>					1		1								
<i>Cyclophyllum</i>							1				1				
<i>Geijera</i>			1		1										
<i>Pichonia</i>			1			1									
<i>Limonium</i>	1				1							1			1
<i>Cakile</i>	1				1				1	1					
<i>Heterostema</i>	1	1			1					1					1
<i>Sarcobolus</i>			1			1	1					1			
<i>Bikkia</i>			1			1	1				1	1			1
<i>Spinifex</i>	1	1			1				1	1					1

of New Guinea, which is unplaced here, though usually second or third for the floras of other substrates!

#### 4. Origin of the calciphilous flora

The results produced by this study of the composition and affinities of the calciphilous flora show a notable difference from the rest of the

vegetation types on other substrates in New Caledonia:

1. The relative paucity of endemics at all levels (specific, but above all generic and familial);
2. The paucity of primitive taxa notably Magnoliidae (*sensu* CRONQUIST 1988): Annonaceae, Hernandiaceae, Lauraceae, Piperaceae, or their absence: Amborellaceae, Chloranthaceae, Monimiaceae, Trimeniaceae, Winteraceae, families that are well present on

TABLE 10. — Floristic affinities of the New Caledonian calciphilous flora.

	Territories	Coefficients
1	Australia	2,56
2	Malesia	2,27
3	North Pacific	2,11
4	Asia	1,22
5	Vanuatu	1,16
6	New Zealand	1,06
7	Solomons	0,91
8	Fiji	0,76
9	Samoa, Tonga	0,52
10	Norfolk	0,41
11	America	0,25

TABLE 11. — Intraspecific taxa of the calciphilous flora.

<i>Cassine pininsularis</i> subsp. <i>poyaensis</i> I.H. Mueller
<i>Cleidion vieillardii</i> var. <i>mareense</i> Guillaumin
<i>Citronella sarmentosa</i> var. <i>lucidula</i> Hürl.
<i>Elaeocarpus hortensis</i> var. <i>neocaledonica</i> Tirel
<i>Euroschinus obtusifolius</i> var. <i>robustus</i> Engl.
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> (L.) van Ooststr.
<i>Nicotiana fragrans</i> Hook. var. <i>fragrans</i>
<i>Ochrosia elliptica</i> fa. <i>syncarpa</i> Boit.
<i>Oxera baladica</i> Vieill. subsp. <i>baladica</i>
<i>Oxera pulchella</i> Labill. subsp. <i>pulchella</i>
<i>Pseuderanthemum repandum</i> subsp. <i>loyaltense</i> (Guillaumin) Heine
<i>Phyllanthus aeneus</i> var. <i>nepouiensis</i> M. Schmid
<i>Phyllanthus loranthioides</i> var. <i>longifolius</i> M. Schmid
<i>Schefflera toto</i> Baill. subsp. <i>toto</i>
<i>Sesbania coccinea</i> (L.f.) Poiret subsp. <i>coccinea</i>

other substrates in New Caledonia, with the exception of Menispermaceae, which have here five species out of eight;

3. The paucity of taxa of restricted distribution contrasted with the abundance of very wide-spread taxa;

4. Certain affinities with very distant scattered islands in the northern tropical Pacific (Hawaii, Micronesia) or the Indian Ocean (Cocos Is.) suggesting immigration by wind-dispersed diaspores.

If one adds the recent nature of the calcareous substrates (the oldest sites date from the Paleocene, and these are not widespread while most are Quaternary in age), it seems clear that the calciphilous flora is of recent origin and results to a large extent from immigrants that

TABLE 12. — Vulnerable (VU), endangered (EN) critically endangered (CR) and extinct (EX) species in the New Caledonian calciphilous flora.

<i>Acropogon</i> sp., Veillon 7830	EN
<i>Alangium</i> sp., Veillon 8050	EN
<i>Cyrtandra mareensis</i> Däniker	EN
<i>Cyphophoenix nucele</i> H. Moore	CR
<i>Cyclophyllum tenuipes</i> Guillaumin	VU
<i>Justicia pinensis</i> S. Moore	EN
<i>Leptostylis</i> sp., Veillon 6850	CR
<i>Oxera pulchella</i> Labill.	CR
<i>Phyllanthus pindaensis</i> M. Schmid	CR
<i>Phyllanthus unifolius</i> M. Schmid	CR
<i>Pittosporum taniatum</i> Veillon & Tirel	EX
<i>Solanum insulaepinorum</i> Heine	EN

arrived by long distance dispersal, with their progeny diversifying in the Quaternary. Evidence for this comes from taxa of infraspecific rank (subspecies, varieties, forms), which have not been considered separately thus far. There are, in the strictly calciphilous flora, seven subspecies, of which one is endemic, seven varieties, of which six are endemic, and one endemic form. — Table 11.

## CONCLUSION

In conclusion, a distinct portion of the New Caledonian flora is inextricably linked to calcareous substrates (calciphilous). Although reduced, it seems, according to our present knowledge, to be sufficiently different and to have a certain uniqueness, with 488 species, 39.7% of which are endemic. Derived from old Gondwanan elements and those more recently arrived by long distance dispersal, the calciphilous flora diversified mainly in the Quaternary, with the appearance of the raised reefs largely on the surrounding islands (Loyalty Islands, Ile des Pins).

This flora has been much disturbed by human activities and some of its species, like *Pittosporum taniatum* recently lost from the Ilot Leprédour, have disappeared, while today others are vulnerable, endangered or critically endangered (BOUCHET et al. 1995; LOWRY 1998; JAFFRÉ et al. 1998). — Table 12.



## ANNEXE

## FLORISTIC LIST OF VEGETATION TYPES ON CALCAREOUS SUBSTRATE

**Status:** A = indigenous; E = endemic. – **Substrate:** C = species restricted to calcareous substrates; UC = species found on both calcareous and ultramafic rocks; CA = species found on both calcareous and other substrates but not on ultramafics; UCA = species found on all substrate types. – **Vegetation types:** L = sclerophyll forest; F = tropical rain forest; P = dunes and back dune vegetation; N = degraded and other vegetation types.

	Status	Substrate	Veg. type
<b>Acanthaceae</b>			
<i>Acanthus ilicifolius</i> L.	A	CA	P
<i>Dicliptera caerulea</i> (G. Forst.) Schinz & Guillaumin	A	C	L, N, P
<i>Justicia pinensis</i> S. Moore	E	CA	F, L
<i>Pseuderanthemum incisum</i> Benoist	E	CA	L
<i>Pseuderanthemum repandum</i> (G. Forst.) Guillaumin	A	UCA	F, L, N
<b>Agavaceae</b>			
<i>Cordyline fruticosa</i> (L.) A. Chev.	A	CA	F, L, N
<b>Aizoaceae</b>			
<i>Sesuvium portulacastrum</i> L.	A	C	P
<i>Tetragonia tetragonioides</i> (Pallas) Kuntze	A	CA	P
<b>Alangiaceae</b>			
<i>Alangium bussyanum</i> (Baill.) Harms	E	UCA	F
<i>Alangium</i> sp., Veillon 7836	E	C	
<i>Alangium</i> sp., Veillon 8050	E	C	
<b>Amaranthaceae</b>			
<i>Achyranthes aspera</i> L.	A	CA	L, N
<i>Alternanthera pungens</i> Kunth	A	CA	N
<i>Alternanthera sessilis</i> (L.) A. DC.	A	CA	N
<i>Amaranthus interruptus</i> R. Br.	A	CA	N
<b>Amaryllidaceae</b>			
<i>Crinum asiaticum</i> L.	A	CA	L, N, P
<b>Anacardiaceae</b>			
<i>Euroschinus obtusifolius</i> Engl.	E	UCA	F, L
<i>Pleiogynium timoriense</i> (DC.) Leenh.	A	CA	L
<i>Semecarpus atra</i> (J.R. Forst.) Vieill.	E	UCA	F, L
<b>Annonaceae</b>			
<i>Meiogyne tiebaghiensis</i> (Däniker) Heusden	E	UCA	F, L
<i>Polyalthia nitidissima</i> (Dunal) Benth.	A	UCA	F, L
<b>Apocynaceae</b>			
<i>Alyxia loeseneriana</i> Schltr.	E	CA	F
<i>Alyxia oppositifolia</i> Boiteau	E	UCA	F
<i>Alyxia pseudoserpentina</i> Boiteau	E	UCA	F, L
<i>Alyxia</i> sp., Veillon 6575	E	CA	L
<i>Alyxia stellata</i> (G. Forst.) Roem. & Schult.	A	UCA	F, L
<i>Artia lifuana</i> (Baill.) Pichon ex Guillaumin	E	UCA	F
<i>Carissa ovata</i> R. Br.	A	CA	L, N
<i>Cerbera manghas</i> L.	A	UCA	F, L, P
<i>Ervatamia lifuana</i> Boiteau	E	UCA	F
<i>Melodinus celastroides</i> Baill.	E	UCA	L
<i>Melodinus scandens</i> J.R. Forst. & G. Forst.	E	CA	L, N, P
<i>Melodinus vitiensis</i> Rolfe	A	C	F
<i>Neisosperma lifuana</i> (Guillaumin) Boiteau	E	UCA	F
<i>Neisosperma oppositifolia</i> (Lam.) Fosberg & Sacht	A	UCA	F, P
<i>Ochrosia elliptica</i> Labill.	A	UC	P
<i>Ochrosia grandiflora</i> Boiteau	E	CA	F
<i>Ochrosia inventorum</i> L. Allorge	E	C	L
<i>Rauvolfia semperflorens</i> (Müll. Arg.) Schltr.	E	UC	F, L

**Araceae**

<i>Epipremnum pinnatum</i> (L.) Engl.	A	CA	F, L, N
---------------------------------------	---	----	---------

**Araliaceae**

<i>Delarbrea paradoxa</i> Vieill.	A	UCA	F, L
<i>Meryta denhamii</i> Seem.	A	CA	F
<i>Meryta sonchifolia</i> Linden & André	E	UCA	F
<i>Schefflera elegantissima</i> (Veitch ex Masters) Lowry & Frodin	E	UCA	F
<i>Schefflera gabriellae</i> Baill.	E	UCA	F
<i>Schefflera</i> sp., Veillon 7874	E	C	
<i>Schefflera toto</i> Baill.	E	CA	F
<i>Schefflera veitchii</i> (Hort. ex Carrière) Frodin & Lowry	A	CA	F, L
<i>Tieghemopanax crenatus</i> (Pancher & Sebert), comb. to be established	E	C	F
<i>Tieghemopanax</i> sp. nov., Lowry ined.	E	CA	L

**Araucariaceae**

<i>Araucaria columnaris</i> (J.R. Forst. & G. Forst.) J.D. Hook.	E	UCA	F
--	---	-----	---

**Asclepiadaceae**

<i>Dischidia nummularia</i> R. Br.	A	C	F
<i>Heterostemma acuminatum</i> Decne.	A	C	F
<i>Hoya nicholsoniae</i> F. Muell.	A	UCA	F, L
<i>Sarcolobus retusus</i> K. Schum.	A	C	L, N
<i>Secamone elliptica</i> R. Br.	A	UCA	F, L
<i>Tylophora biglandulosa</i> (Endl.) F. Muell.	A	UCA	F, L

**Balanophoraceae**

<i>Balanophora fungosa</i> J.R. Forst. & G. Forst.	A	CA	F, L
--	---	----	------

**Bignoniaceae**

<i>Pandorea pandorana</i> (Andrews) Steenis	A	UCA	F
---	---	-----	---

**Bischofiaceae**

<i>Bischofia javanica</i> Blume	A	CA	F, N
---------------------------------	---	----	------

**Boraginaceae**

<i>Argusia argentea</i> (L. f.) Heine	A	CA	P
<i>Cordia subcordata</i> Lam.	A	UCA	P
<i>Heliotropium anomalum</i> Hook. & Arn.	A	C	P

**Burseraceae**

<i>Canarium balansae</i> Engl.	E	CA	F
<i>Garuga floribunda</i> Decne.	A	CA	F, L

**Caesalpiniaceae**

<i>Caesalpinia crista</i> L.	A	CA	F, L
<i>Cassia gaudichaudii</i> Hook. & Arn.	A	C	F, P
<i>Intsia bijuga</i> (Colebr.) Kuntze	A	CA	F, P
<i>Mezoneurum baudouinii</i> Guillaumin	E	UC	F
<i>Mezoneurum deverdiana</i> Guillaumin	E	UC	N

**Capparaceae**

<i>Capparis artensis</i> Montrouz.	E	UCA	L
<i>Capparis neocaledonica</i> Vieill. ex Schltr.	E	CA	L

**Casuarinaceae**

<i>Casuarina collina</i> Poisson	E	UCA	L, N
<i>Casuarina equisetifolia</i> L.	A	UC	P

**Celastraceae**

<i>Cassine curtispindula</i> (Endl.) Kuntze	A	CA	F, L
<i>Cassine pininsularis</i> (Hürl.) I.H. Muller	E	UCA	F
<i>Celastrus paniculatus</i> Willd.	A	CA	L, N
<i>Pleurostyliia opposita</i> (Willd.) Alston	A	UCA	L

**Chenopodiaceae**

<i>Atriplex jubata</i> S. Moore	E	C	P
<i>Chenopodium carinatum</i> R. Br.	A	CA	N
<i>Einadia nutans</i> (R. Br.) A.J. Scott	A	C	N
<i>Kochia hirsuta</i> Nolte	A	CA	P
<i>Salsola kali</i> L.	A	C	P
<i>Suaeda maritima</i> (L.) Dummer	A	C	P

**Chrysobalanaceae**

*Hunga lifouana* (Däniker) Prance E UC F

**Combretaceae**

*Terminalia catappa* L. A CA N  
*Terminalia novocaledonica* Däniker E UC L  
*Terminalia rubricarpa* Baker f. E CA L, P

**Compositae**

*Eclipta prostrata* (L.) L. A CA N, P  
*Epaltes australis* Less. A CA N  
*Lipochaeta lifouana* Hochr. E C  
*Pseudognaphalium luteoalbum* (L.) Hilliard & B.L. Burtl. A CA N, P  
*Sigesbeckia orientalis* L. A CA N  
*Tridax procumbens* L. A CA N  
*Vernonia cinerea* (L.) Lesson A UCA N, P  
*Vittadinia simulans* N. Burb. E CA N  
*Wedelia aristata* Less. A CA N, P  
*Wollastonia biflora* (L.) DC. A UCA N, P

**Convolvulaceae**

*Dichondra repens* J.R. Forst. & G. Forst. A CA L  
*Ipomoea indica* (Burm. f.) Merr. A UCA N, P  
*Ipomoea littoralis* Blume A C P  
*Ipomoea macrantha* Roem. & Schult. A UC N, P  
*Ipomoea pes-caprae* (L.) R. Br. A C P  
*Operculina turpethum* (L.) Manso A CA N  
*Polymeria pusilla* R. Br. A CA N  
*Turbina inopinata* Heine E CA L

**Corynocarpaceae**

*Corynocarpus dissimilis* Hemsley E UCA F, L

**Cruciferae**

*Cakile maritima* Scop. A C P  
*Coronopus integrifolius* (DC.) Spreng. A C P  
*Lepidium bidentatum* Montin A CA N, P  
*Rorippa sarmentosa* (DC.) Macbride A CA N

**Cucurbitaceae**

*Diplocyclos palmatus* (L.) C. Jeffrey A CA F, N  
*Zehneria baueriana* Endl. A CA N  
*Zehneria mucronata* (Blume) Miq. A CA N

**Cycadaceae**

*Cycas seemanii* Braun A UCA P

**Cyperaceae**

*Cladium mariscus* (L.) Pohl A UCA N  
*Cladium ouveanum* (Däniker) Guillaumin E CA F  
*Cyperus brevifolius* (Rottb.) Hassk. A CA N  
*Cyperus compressus* L. A C L  
*Cyperus gracilis* R. Br. A CA L, N  
*Fimbristylis cymosa* R. Br. A UC P  
*Fimbristylis ferruginea* Vahl A UCA N, P  
*Kyllinga nemoralis* (J.R. Forst. & G. Forst.) Dandy ex Hutch. A CA N  
*Mariscus cyperinus* (Retz.) Vahl A C N  
*Mariscus javanicus* (Houtt.) Merr. & Metcalf A CA N, P  
*Mariscus laeteflorens* C.B. Clarke E CA P  
*Mariscus sumatrensis* (Retz.) Raynal A CA N  
*Pycreus polystachyos* (Rottb.) P. Beauv. A UCA N  
*Rhynchospora corymbosa* (L.) Britton A UCA N, P  
*Scirpus subulatus* Vahl A CA P  
*Scleria neocaledonica* Rendle E UC L  
*Torulinium odoratum* (L.) Hooper A CA N

**Dilleniaceae**

*Tetracera billardieri* Martelli E UCA F, L, N

**Dioscoreaceae**

<i>Dioscorea bulbifera</i> L.	A	CA	F, L, N
-------------------------------	---	----	---------

**Ebenaceae**

<i>Diospyros calciphila</i> F. White	E	UC	F
<i>Diospyros fasciculosa</i> (F. Muell.) F. Muell.	A	UCA	F, L
<i>Diospyros impolita</i> F. White	E	CA	L
<i>Diospyros inexplorata</i> F. White	E	C	F
<i>Diospyros minimifolia</i> F. White	E	CA	L
<i>Diospyros olen</i> Hiern	A	UCA	F, L
<i>Diospyros perplexa</i> F. White	E	CA	L
<i>Diospyros pustulata</i> F. White	E	CA	L
<i>Diospyros</i> sp., Veillon 7386	E	CA	L
<i>Diospyros tridentata</i> F. White	E	C	F
<i>Diospyros yaouhensis</i> (Schltr.) Kosterm.	E	UCA	F, L

**Elaeocarpaceae**

<i>Elaeocarpus angustifolius</i> Blume	A	UCA	F, N
<i>Elaeocarpus hortensis</i> Guillaumin	A	C	F
<i>Elaeocarpus rotundifolius</i> Brongn. & Gris	E	UCA	F

**Erythroxylaceae**

<i>Erythroxylum novocaledonicum</i> O. Schulz	E	UCA	L
---	---	-----	---

**Euphorbiaceae**

<i>Acalypha grandis</i> Benth.	A	CA	N, P
<i>Acalypha pancheriana</i> Baill.	E	CA	F, L, N
<i>Acalypha pulchrespicata</i> Däniker	E	C	F
<i>Aleurites moluccana</i> (L.) Willd.	A	CA	F, L, N
<i>Baloghia inophylla</i> (G. Forst.) P.S. Green	A	UCA	F, L
<i>Bocquillonia sessiliflora</i> Baill.	E	UCA	L
<i>Breynia disticha</i> J.R. Forst. & G. Forst.	A	UCA	L
<i>Claoxylon insulanum</i> Müll. Arg.	E	UCA	F, L
<i>Cleidion lemurum</i> McPherson	E	C	F
<i>Cleidion verticillatum</i> Baill.	E	CA	F, L
<i>Cleistanthus stipitatus</i> (Baill.) Müll. Arg.	E	UCA	F, L
<i>Codiaeum peltatum</i> (Labill.) P.S. Green	A	UCA	L
<i>Croton insularis</i> Baill.	A	UCA	F, L
<i>Drypetes deplanchei</i> (Brongn. & Gris) Merr.	A	UCA	F, L
<i>Euphorbia atoto</i> G. Forst.	A	UCA	N
<i>Euphorbia neocaledonica</i> Boiss.	A	CA	P
<i>Euphorbia obliqua</i> Endl.	A	CA	P
<i>Euphorbia pancheri</i> Baill.	A	CA	P
<i>Euphorbia tannensis</i> Spreng.	A	UCA	N, P
<i>Excoecaria agallocha</i> L.	A	CA	P
<i>Fontainea pancheri</i> (Baill.) Heckel	A	CA	F, L
<i>Glochidion billardieri</i> Baill.	E	UCA	F, L, N
<i>Glochidion caledonicum</i> Müll. Arg.	E	UCA	F, L, N
<i>Mallotus repandus</i> (Willd.) Müll. Arg.	A	UCA	F, L, N
<i>Omalanthus nutans</i> (G. Forst.) Guillemin	A	UCA	L, N
<i>Omalanthus repandus</i> Schltr.	E	UCA	F, N
<i>Omalanthus schlechteri</i> Pax & K. Hoffm.	E	UCA	F, L, N
<i>Phyllanthus aeneus</i> Baill.	E	UCA	F, L
<i>Phyllanthus calcicola</i> M. Schmid	E	C	F
<i>Phyllanthus deplanchei</i> (Baill.) Müll. Arg.	E	CA	L
<i>Phyllanthus faguetii</i> Baill.	E	CA	F, L
<i>Phyllanthus loranthoides</i> Baill.	E	UCA	F, L
<i>Phyllanthus macrochorion</i> Baill.	E	CA	F, L
<i>Phyllanthus ouveanus</i> Däniker	E	C	F
<i>Phyllanthus pindaiensis</i> M. Schmid	E	C	L
<i>Phyllanthus unifoliatus</i> M. Schmid	E	C	F, L

**Flacourtiaceae**

<i>Casearia lifuana</i> Däniker	E	CA	F
<i>Homalium deplanchei</i> (Vieill.) Warb.	E	UCA	L
<i>Homalium serratum</i> Guillaumin	E	UCA	F, N

<i>Xylosma lifuanum</i> Guillaumin	E	C	F, P
<i>Xylosma orbiculatum</i> (J.R. Forst. & G. Forst.) G. Forst.	A	C	F
<b>Gentianaceae</b>			
<i>Centaurium spicatum</i> (L.) Fritsch	A	UCA	L, N
<b>Gesneriaceae</b>			
<i>Cyrtandra mareensis</i> Däniker	E	C	F
<b>Goodeniaceae</b>			
<i>Scaevola sericea</i> Vahl	A	CA	P
<b>Gramineae</b>			
<i>Brachiaria paspaloides</i> (C. Presl) Hubbard	A	UCA	N, P
<i>Cenchrus calyculatus</i> Cav.	A	CA	N, P
<i>Centosteca lappacea</i> (L.) Desv.	A	CA	F
<i>Chloris divaricata</i> R. Br.	A	CA	N, P
<i>Chrysopogon aciculatus</i> (Retz.) Trin.	A	UCA	N
<i>Cynodon dactylon</i> (L.) Pers.	A	UCA	N, P
<i>Digitaria caledonica</i> Henrard	A	UCA	N
<i>Digitaria montana</i> Henrard	E	UCA	L, P
<i>Digitaria radicata</i> (C. Presl) Miq.	A	CA	N, P
<i>Digitaria setigera</i> Roth ex Roem. & Schult.	A	UCA	N
<i>Eragrostis scabriflora</i> Swallen	A	C	N
<i>Eragrostis spartinooides</i> Steud.	A	UCA	N
<i>Eragrostis tenella</i> (L.) P. Beauv. ex Roem. & Schult.	A	CA	P
<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.	A	UCA	N
<i>Ischaemum foliosum</i> Hackel	A	C	P
<i>Ischaemum muticum</i> L.	A	UCA	P
<i>Leptochloa decipiens</i> (R. Br.) Stapf ex Maiden	A	CA	L, P
<i>Lepturopetium kuniense</i> Morat	E	C	P
<i>Lepturus repens</i> (J.R. Forst. & G. Forst.) R. Br.	A	C	L, P
<i>Oplismenus hirtellus</i> (L.) P. Beauv.	A	UCA	F, L
<i>Ottochloa nodosa</i> (Kunth) Dandy	A	CA	N
<i>Paspalum urvillei</i> Steud.	A	UCA	N
<i>Roettboellia coelorachis</i> J.R. Forst.	A	UCA	P
<i>Saccharum spontaneum</i> L.	A	C	N
<i>Setaria austrocaledonica</i> (Bal.) Camus A.	E	UCA	L
<i>Setaria elegantula</i> (Mez) Morat	E	UC	L, N, P
<i>Spinifex sericeus</i> R. Br.	A	C	P
<i>Stenotaphrum micranthum</i> (Desv.) Hubb. ex Hubb. & Vaughan	A	C	P
<i>Thuarea involuta</i> (G. Forst.) R. Br. ex Roem. & Schult.	A	UC	N, P
<i>Tragus australianus</i> S.T. Blake	A	CA	N
<i>Zoysia tenuifolia</i> Willd. ex Trin.	A	C	P
<b>Guttiferae</b>			
<i>Calophyllum inophyllum</i> L.	A	CA	P
<i>Hypericum gramineum</i> J.R. Forst.	A	CA	N
<i>Mammea odorata</i> (Raf.) Kosterm.	A	C	P
<b>Haloragidaceae</b>			
<i>Haloragis prostrata</i> J.R. Forst. & G. Forst.	A	UC	P
<b>Hemerocallidaceae</b>			
<i>Geitonoplesium cymosum</i> (R. Br.) A. Cunn. ex Hook.	A	UCA	F, L
<b>Hernandiaceae</b>			
<i>Gyrocarpus americanus</i> Jacq.	A	CA	F, L
<i>Hernandia cordigera</i> Vieill.	E	UCA	F, L
<i>Hernandia nymphaeifolia</i> (C. Presl) Kubitzki	A	CA	P
<b>Icacinaeae</b>			
<i>Citronella sarmentosa</i> (Baill.) Howard	E	UCA	F
<b>Labiatae</b>			
<i>Clerodendrum inerme</i> (L.) Gaertn.	A	UCA	L, P
<i>Leucas decemdentata</i> (Willd.) J. Smith	A	C	N
<i>Oxera baladica</i> Vieill.	E	UCA	F
<i>Oxera balansae</i> Dubard	E	C	F, L

<i>Oxera pulchella</i> Labill.	E	CA	F, L
<i>Oxera robusta</i> Vieill.	E	UCA	F, L
<i>Oxera sulfurea</i> Dubard	E	CA	L
<i>Plectranthus forsteri</i> Benth.	A	CA	L, N
<i>Plectranthus parviflorus</i> Willd.	A	UCA	L
<i>Vitex trifolia</i> L.	A	CA	L, P
<b>Lauraceae</b>			
<i>Cryptocarya lifuensis</i> Guillaumin	E	CA	F, L
<i>Cryptocarya schmidii</i> Kosterm.	E	C	F, L
<b>Liliaceae</b>			
<i>Dianella adenanthera</i> (G. Forst.) M.R. Hend.	A	UCA	F, L
<i>Dianella plicata</i> Schlitter	E	CA	L, P
<b>Loganiaceae</b>			
<i>Fagraea berteriana</i> A. Gray	A	UCA	F, L, N, P
<b>Loranthaceae</b>			
<i>Amyema artensis</i> (Montrouz.) Danser	A	UCA	F
<i>Amyema scandens</i> (Tiegh.) Danser	A	UCA	F
<i>Amylothea dictyophleba</i> (F. Muell.) Tiegh.	A	UCA	F
<b>Lythraceae</b>			
<i>Pemphis acidula</i> J.R. Forst. & G. Forst.	A	CA	P
<b>Malpighiaceae</b>			
<i>Tristellateia australasiae</i> A. Rich.	A	CA	N, P
<b>Malvaceae</b>			
<i>Abelmoschus manihot</i> (L.) Medik.	A	CA	N
<i>Abelmoschus moschatus</i> (L.) Medik.	A	CA	N
<i>Abutilon auritum</i> (Wall. ex Link) Sweet	A	CA	N
<i>Abutilon indicum</i> (L.) Sweet	A	CA	N, P
<i>Abutilon mollissimum</i> (Cav.) Sweet	A	CA	N, P
<i>Abutilon oxycarpum</i> F. Muell.	A	C	N
<i>Hibiscus tiliaceus</i> L.	A	CA	N, P
<i>Sida nummularia</i> Baker f.	E	CA	P
<i>Thespesia populnea</i> (L.) Sol. ex Correa	A	UC	P
<b>Meliaceae</b>			
<i>Aglaiella elaeagnoidea</i> (Juss.) Benth.	A	UCA	F, L
<i>Dysoxylum bijugum</i> (Labill.) Seem.	A	UCA	F, L
<i>Dysoxylum rufescens</i> Vieill. ex Pancher & Sebert	E	UCA	F, L
<i>Xylocarpus granatum</i> J. König	A	UCA	P
<i>Xylocarpus rumphii</i> (Kostel.) Mabb.	A	C	P
<b>Menispermaceae</b>			
<i>Hypserpa neocaledonica</i> Diels	A	UCA	F, L
<i>Hypserpa vieillardii</i> Diels	E	UCA	F
<i>Pachygone loyaltiensis</i> Diels	E	UCA	F, L
<i>Stephania japonica</i> (Thunb.) Miers	A	UCA	F, P
<i>Tinospora neocaledonica</i> Forman	E	CA	F
<b>Mimosaceae</b>			
<i>Acacia simplex</i> (Sparrm.) Pedley	A	CA	P
<i>Acacia spirorbis</i> Labill.	A	UCA	L, N
<i>Adenanthera pavonina</i> L.	A	CA	F
<i>Schleinitzia insularum</i> (Guillemin) Burkart	A	UCA	P
<i>Serianthes lifouensis</i> (Fosberg) Nielsen	E	C	F
<i>Serianthes sachetae</i> Fosberg	E	UCA	F
<b>Moraceae</b>			
<i>Ficus habrophylla</i> G. Benn. ex Seem.	A	CA	N, P
<i>Ficus lifouensis</i> Corner	E	C	F
<i>Ficus mareensis</i> Warb.	E	C	F
<i>Ficus microcarpa</i> L. f.	A	CA	F, L
<i>Ficus obliqua</i> J.R. Forst.	A	CA	F, L
<i>Ficus prolixa</i> J.R. Forst.	A	CA	F, L
<i>Ficus scabra</i> J.R. Forst.	A	CA	P

<i>Ficus virgata</i> Reinw.	A	UCA	F, L
<i>Maclura cochinchinensis</i> (Lour.) Corner	A	CA	L, N, P
<i>Malaisia scandens</i> (Lour.) Planchon	A	CA	F, L, N, P
<i>Streblus pendulinus</i> (Endl.) F. Muell.	A	UCA	F, L, N, P
<b>Myoporaceae</b>			
<i>Myoporum crassifolium</i> J.R. Forst. & G. Forst.	A	CA	P
<i>Myoporum cuneifolium</i> Kränzl.	E	CA	P
<i>Myoporum obscurum</i> Endl.	A	CA	P
<i>Myoporum rotundatum</i> S. Moore	E	CA	P
<i>Myoporum serratum</i> R. Br.	A	CA	P
<i>Myoporum tenuifolium</i> J.R. Forst. & G. Forst.	A	UCA	L, P
<i>Myoporum tubiflorum</i> Kränzl.	E	UC	P
<b>Myrsinaceae</b>			
<i>Maesa novocaledonica</i> Mez	E	UCA	F, L, N
<i>Rapanea lanceolata</i> Mez	E	UCA	F
<i>Rapanea lecardii</i> Mez	E	CA	F, L
<i>Rapanea lifuensis</i> Mez	E	CA	F
<i>Rapanea macrophylla</i> (Pancher & Sebert) Mez	E	UC	F
<b>Myrtaceae</b>			
<i>Austromyrtus mendute</i> (Guillaumin) Burret	E	CA	F
<i>Austromyrtus</i> sp., Veillon 6578	E	C	L
<i>Austromyrtus</i> sp., Veillon 6853	E	C	L
<i>Austromyrtus</i> sp., Jaffré 2535	E	UC	L
<i>Austromyrtus</i> sp., Veillon 7039	E	C	L
<i>Austromyrtus</i> sp., Jaffré & Rigault 2990	E	C	L
<i>Cloezia artensis</i> (Montrouz.) P.S. Green	E	UCA	L
<i>Cloezia floribunda</i> Brongn. & Gris	E	UC	N
<i>Eugenia daenikeri</i> Guillaumin	E	UC	L
<i>Eugenia gacognei</i> Montrouz.	E	UCA	L
<i>Eugenia noumeensis</i> Guillaumin	E	CA	L
<i>Eugenia ouentoroensis</i> Guillaumin	E	CA	L
<i>Ptilocalyx wagapensis</i> Brongn. & Gris	E	CA	F
<i>Syzygium aggregatum</i> J.W. Dawson	E	CA	L
<i>Syzygium densiflorum</i> Brongn. & Gris	E	UCA	F, L
<i>Syzygium koumacense</i> J.W. Dawson	E	C	F
<i>Syzygium pendulinum</i> J.W. Dawson	E	C	F, L
<i>Syzygium pennellii</i> (Guillaumin) J.W. Dawson	E	UC	F, L
<i>Syzygium poyanum</i> J.W. Dawson	E	UCA	L
<i>Syzygium pseudopinnatum</i> Däniker	E	UCA	F
<i>Syzygium veillonii</i> J.W. Dawson	E	CA	L
<i>Uromyrtus</i> sp., Veillon 6579	E	CA	L
<b>Nyctaginaceae</b>			
<i>Boerhavia diffusa</i> L.	A	CA	F, L, P
<i>Pisonia aculeata</i> L.	A	CA	F, L
<i>Pisonia artensis</i> (Montrouz.) Heimerl	E	UCA	F, L
<i>Pisonia grandis</i> R. Br.	A	CA	F, L
<b>Olacaceae</b>			
<i>Ximения americana</i> L.	A	CA	L, N, P
<b>Oleaceae</b>			
<i>Chionanthus brachystachys</i> (Schltr.) P.S. Green	A	UCA	F
<i>Jasminum didymum</i> G. Forst.	A	UCA	F, L
<i>Jasminum elatum</i> Pancher ex Guillaumin	E	UCA	F, L
<i>Jasminum simplicifolium</i> G. Forst.	E	UCA	F, L
<i>Olea paniculata</i> R. Br.	A	UCA	F, L
<b>Orchidaceae</b>			
<i>Cleisostoma pacificum</i> P.J. Cribb & A. Lewis	A	UCA	F
<i>Dendrobium macranthum</i> A. Rich.	A	UC	F
<i>Dockrillia bowmani</i> (Benth.) M.A. Clem. & D.L. Jones	A	CA	F, L
<i>Luisia teretifolia</i> Gaudich.	A	UCA	F, L
<i>Nervilia aragoana</i> Gaudich.	A	CA	F, L

<i>Nervilia crociformis</i> (Zoll. & Moritzi) Seidenf.	A	UCA	F
<i>Oberonia titania</i> Lindl.	A	UCA	F
<i>Taeniophyllum fasciola</i> (G. Forst.) Reichb. f.	A	CA	F, L
<b>Palmae</b>			
<i>Cocos nucifera</i> L.	A	CA	N, P
<i>Cyphophoenix nucele</i> H. Moore	E	C	F
<b>Pandanaceae</b>			
<i>Pandanus pedunculatus</i> R. Br.	A	CA	L, P
<i>Pandanus tectorius</i> Parkinson	A	CA	L, P
<b>Papilionaceae</b>			
<i>Abrus precatorius</i> L.	A	CA	F, L, N
<i>Arthroclianthus microbotrys</i> Hochr.	E	CA	F, L
<i>Canavalia rosea</i> (Sw.) DC.	A	CA	L, P
<i>Canavalia sericea</i> A. Gray	A	CA	P
<i>Dalbergia candenatensis</i> (Dennst.) Prain	A	CA	P
<i>Dendrolobium umbellatum</i> (L.) Benth.	A	UCA	L, P
<i>Derris trifoliata</i> Lour.	A	UCA	L, P
<i>Desmodium varians</i> G. Don	A	UC	L
<i>Lotus australis</i> Andrews	A	CA	P
<i>Mucuna gigantea</i> (Willd.) A. DC.	A	CA	F, N
<i>Pueraria lobata</i> (Willd.) Ohwi	A	CA	N, P
<i>Sesbania coccinea</i> (L. f.) Poiré	A	C	P
<i>Sophora sp.</i> , Veillon 6573	E	UC	L
<i>Sophora tomentosa</i> L.	A	CA	P
<i>Tephrosia purpurea</i> (L.) Pers.	A	UCA	P
<i>Uraria lagopoides</i> A. DC.	A	UCA	N
<i>Vigna marina</i> (Burm. f.) Merr.	A	CA	P
<b>Passifloraceae</b>			
<i>Passiflora aurantia</i> G. Forst.	A	UCA	F, L, N
<b>Phellinaceae</b>			
<i>Phelline comosa</i> Labill.	E	UCA	F
<b>Phytolaccaceae</b>			
<i>Monococcus echinophorus</i> F. Muell.	A	CA	F, L, N
<i>Phytolacca octandra</i> L.	A	CA	F, L, P
<b>Piperaceae</b>			
<i>Piper austrocaledonicum</i> C. DC.	A	UCA	F, L
<b>Pittosporaceae</b>			
<i>Pittosporum coccineum</i> (Montrouz.) Beauvis.	E	UCA	F
<i>Pittosporum leroyanum</i> Tirel & Veillon	E	C	F, L
<i>Pittosporum mackeei</i> Veillon & Tirel	E	CA	F
<i>Pittosporum obovatum</i> Guillaumin	E	C	F
<i>Pittosporum suberosum</i> Pancher ex Brongn. & Gris	E	CA	L
<i>Pittosporum taniaum</i> Veillon & Tirel	E	C	L
<b>Plumbaginaceae</b>			
<i>Limonium tetragonum</i> (Thunb.) Bullock	A	C	P
<i>Plumbago zeylanica</i> L.	A	CA	L, N, P
<b>Portulacaceae</b>			
<i>Portulaca lutea</i> J.R. Forst. & G. Forst.	A	C	N, P
<i>Portulaca oleracea</i> L.	A	CA	N
<i>Portulaca quadrifida</i> L.	A	C	P
<b>Primulaceae</b>			
<i>Anagallis arvensis</i> L.	A	CA	N, P
<i>Lysimachia decurrens</i> J.R. Forst.	A	CA	N
<i>Lysimachia mauritiana</i> Lam.	A	UCA	P
<i>Samolus repens</i> (J.R. Forst. & G. Forst.) Pers.	A	UCA	P
<b>Ranunculaceae</b>			
<i>Clematis pickeringii</i> Gray	A	UCA	L, N



**Rhamnaceae**

<i>Colubrina asiatica</i> (L.) Brongn.	A	CA	L, N, P
<i>Emmenosperma pancherianum</i> Baill.	E	CA	L
<i>Gouania leratii</i> Schltr.	E	UCA	L
<i>Rhamnella vitiensis</i> (Benth.) A.C. Sm.	A	CA	L, N
<i>Ventilago pseudocalyculata</i> Guillaumin	E	UCA	F, L

**Rubiaceae**

<i>Bikkia tetrandra</i> (L. f.) A. Rich.	A	C	P
<i>Cyclophyllum tenuipes</i> Guillaumin	E	C	P
<i>Gardenia urvillei</i> Montrouz.	E	UCA	L
<i>Guettarda speciosa</i> L.	A	CA	P
<i>Hedyotis foetida</i> (G. Forst.) Seem.	A	C	P
<i>Ixora cauliflora</i> Montrouz.	E	CA	F, L
<i>Ixora collina</i> (Montrouz.) Beauvis.	A	UCA	F, L
<i>Morinda citrifolia</i> L.	A	UCA	F, L, N, P
<i>Morinda myrtifolia</i> A. Gray	A	UCA	F, N
<i>Oldenlandia biflora</i> L.	A	CA	L, N
<i>Pavetta opulina</i> A. DC.	A	UCA	F, L
<i>Psychotria collina</i> Labill.	A	UCA	F, L
<i>Psychotria coptosperma</i> (Baill.) Guillaumin	E	UC	L
<i>Psydrax odorata</i> (G. Forst.) A.C. Sm. & Darwin	A	UCA	L
<i>Randia sezzitat</i> Guillaumin	E	C	F
<i>Scyphiphora hydrophyllacea</i> Gaertn.	A	UCA	P
<i>Spermacoce assurgens</i> Ruiz & Pavon	A	CA	L, N
<i>Tarenna lifouana</i> (Däniker) Jérémie	E	C	F
<i>Timonius polygamus</i> (G. Forst.) Robinson	A	C	P

**Rutaceae**

<i>Citrus macroptera</i> Montrouz.	A	CA	F
<i>Euodia hortensis</i> J.R. Forst. & G. Forst.	A	C	P
<i>Geijera balansae</i> (Baill.) Schinz & Guillaumin	E	UCA	F, L
<i>Geijera salicifolia</i> Schott	A	C	F
<i>Halfordia kendac</i> (Montrouz.) Guillaumin	A	UCA	F, L, N
<i>Micromelum minutum</i> (J.R. Forst. & G. Forst.) Wight & Arn.	A	CA	F, L
<i>Murraya crenulata</i> Oliver	A	C	F, L
<i>Murraya paniculata</i> (L.) Jack	A	CA	F, L
<i>Oxanthera</i> sp., Veillon 7005	E	CA	L
<i>Zanthoxylum pancheri</i> P.S. Green	E	UCA	F, L
<i>Zieridium gracile</i> Baill.	E	UC	L
<i>Zieridium</i> sp., Veillon 6872	E	UC	L

**Sapindaceae**

<i>Alectryon carinatum</i> Radlk.	E	CA	F, L
<i>Allophylus ternatus</i> (J.R. Forst. & G. Forst.) Radlk.	A	C	P
<i>Allophylus timoriensis</i> (A. DC.) Blume	A	C	L, N, P
<i>Arytera arcuata</i> Radlk.	E	CA	F, L
<i>Arytera chartacea</i> Radlk.	E	CA	F, L
<i>Arytera collina</i> (Pancher & Sebert) Radlk.	E	CA	L
<i>Arytera lepidota</i> Radlk.	E	UC	F, L
<i>Arytera neoebudensis</i> (Guillaumin) H. Turner	A	CA	F, L
<i>Cossinia trifoliata</i> (Baill.) Radlk.	E	UC	L
<i>Cupaniopsis globosa</i> Adema	E	CA	L
<i>Cupaniopsis glomeriflora</i> Radlk.	E	UCA	F, L
<i>Cupaniopsis hypodermatica</i> Radlk.	E	UCA	F
<i>Cupaniopsis inoplaea</i> Radlk.	E	UCA	F
<i>Cupaniopsis pennellii</i> Guillaumin	E	CA	F, L
<i>Cupaniopsis</i> sp., Veillon 7051	E	C	
<i>Elattostachys apetala</i> (Labill.) Radlk.	A	UCA	F, L
<i>Elattostachys incisa</i> Radlk.	E	CA	F, L
<i>Guioa glauca</i> (Labill.) Radlk.	E	UCA	F
<i>Guioa gracilis</i> (Pancher & Sebert) Radlk.	E	UCA	F, L
<i>Guioa pectinata</i> Radlk.	E	UCA	F, N

<i>Harpullia austrocaledonica</i> Baill.	E	UCA	F, L
<i>Podonephelium homei</i> (Seem.) Radlk.	E	UCA	F, L
<i>Podonephelium parvifolium</i> Radlk.	E	C	F, N
<b>Sapotaceae</b>			
<i>Leptostylis</i> sp., Veillon 6850	E	C	L
<i>Manilkara dissecta</i> (L.) Dubard	A	UCA	F, L
<i>Mimusops elengi</i> L.	A	CA	F, L, P
<i>Pichonia balansana</i> Pierre	E	C	F
<i>Planchonella cinerea</i> (Pancher) Royen	E	CA	L
<i>Planchonella lifuana</i> (Baill.) Pierre ex Dubard	E	UC	F
<i>Planchonella linggensis</i> (Burck) Pierre	A	CA	F
<i>Planchonella</i> sp., Veillon 6585	E	CA	L
<b>Solanaceae</b>			
<i>Nicotiana debneyi</i> Domin	A	CA	N, P
<i>Nicotiana fragrans</i> Hook. f.	A	C	P
<i>Solanum insulaepinorum</i> Heine	E	C	P
<i>Solanum nigrum</i> L.	A	CA	N
<b>Sterculiaceae</b>			
<i>Acropogon bullatus</i> (Pancher & Sebert) Morat	E	CA	F, L
<i>Acropogon</i> sp., Veillon 7830	E	C	L
<i>Acropogon veillonii</i> Morat	E	CA	F
<b>Surianaceae</b>			
<i>Suriana maritima</i> L.	A	CA	P
<b>Taccaceae</b>			
<i>Tacca leontopetaloides</i> (L.) Kuntze	A	CA	F, L, N, P
<b>Thymelaeaceae</b>			
<i>Lethedon tannensis</i> Spreng.	E	UCA	F, L
<i>Wikstroemia indica</i> (L.) Meyer	A	UCA	F, L, N
<b>Tiliaceae</b>			
<i>Corchorus torresianus</i> Gaudich.	A	C	L, P
<i>Grewia crenata</i> (J.R. Forst.) Schinz & Guillaumin	A	CA	F, L, N, P
<i>Triumfetta procumbens</i> J.R. Forst. & G. Forst.	A	CA	P
<b>Ulmaceae</b>			
<i>Celtis conferta</i> Planch.	A	UCA	L
<i>Celtis paniculata</i> (Endl.) Planch.	A	CA	F, L
<i>Trema cannabina</i> Lour.	A	UCA	L, N
<b>Umbelliferae</b>			
<i>Apium prostratum</i> Labill. ex Vent.	A	CA	N, P
<i>Centella asiatica</i> (L.) Urban	A	CA	L, N, P
<i>Trachymene cussonii</i> (Montrouz.) Burt	A	CA	P
<b>Urticaceae</b>			
<i>Dendrocnide latifolia</i> (Gaudich.) Chew	A	CA	F
<i>Dendrocnide peltata</i> (Blume) Miq.	A	CA	F
<i>Dendrocnide vitiensis</i> (Seem.) Chew	A	C	F
<i>Nothocnide repanda</i> (Blume) Blume	A	CA	F, N, P
<i>Pipturus argenteus</i> (J.R. Forst.) Wedd.	A	UCA	N
<b>Violaceae</b>			
<i>Hybanthus caledonicus</i> (Turcz.) Cretz.	E	UCA	F, L
<b>Viscaceae</b>			
<i>Korthalsella disticha</i> (Endl.) Engl.	A	UCA	F
<b>Vitaceae</b>			
<i>Cayratia carnososa</i> Griseb.	A	CA	F, N
<i>Cayratia japonica</i> Griseb.	A	UCA	F, N
<i>Cissus glaucoramea</i> Griseb.	A	UCA	F, L, N
<b>Zygophyllaceae</b>			
<i>Tribulus cistoides</i> L.	A	C	P

## Acknowledgements

The authors thank J.D. MABBERLEY (Greening, Australia) for the English translation of the manuscript, F. RIGAUT (I.R.D., Nouméa) for preparing the list of species, and P.P. LOWRY (M.B.G.) for re-reading the paper and making suggestions.

## REFERENCES

- BOUCHET Ph., JAFFRÉ T. & VEILLON J.-M. 1995. — Plant extinction in New Caledonia: protection of sclerophyll forests urgently needed. *Biodiversity and Conservation* 4: 415-428.
- CRONQUIST A. 1988. — *An Integrated System of Classification of flowering Plants*. Columbia University Press, New York.
- JAFFRÉ T. 1976. — Composition chimique et conditions de l'alimentation minérale sur roches ultrabasiques en Nouvelle-Calédonie. *Cah. ORSTOM*, sér. Biologie, vol. 11: 53-63.
- JAFFRÉ T. 1980. — Étude écologique du peuplement végétal des sols dérivés de roches ultrabasiques en Nouvelle-Calédonie. *Coll. Trav. Doc. ORSTOM* n° 127, 274 p.
- JAFFRÉ T., MORAT Ph., VEILLON J.-M. & MACKEE H.S. 1988. — Changements dans la végétation de la Nouvelle-Calédonie au cours du Tertiaire: la végétation et la flore des roches ultrabasiques. *Bull. Mus. Natl. Hist. Nat., B, Adansonia* 9: 365-391.
- JAFFRÉ T., MORAT Ph. & VEILLON J.-M. 1993. — Étude floristique et phytogéographique de la forêt sclérophylle de Nouvelle-Calédonie. *Bull. Mus. Natl. Hist. Nat., B, Adansonia* 15: 107-146.
- JAFFRÉ T., BOUCHET Ph. & VEILLON J.-M. 1998. — Threatened plants of New Caledonia: Is the system of protected areas adequate? *Biodiversity and Conservation* 7: 109-135.
- LOWRY II P.P. 1998. — Diversity, endemism, and extinction in the flora of New Caledonia: a review: 181-206, in PENG C.I. & LOWRY II P.P. (eds.), *Proceedings of the International Symposium on Rare, Threatened, and Endangered Floras of Asia and the Pacific*. Academia Sinica, Taipei.
- MORAT Ph., JAFFRÉ T., VEILLON J.-M. & MACKEE H.S. 1981. — Les Formations végétales: Pl. 15. *Atlas de la Nouvelle-Calédonie* (carte + notice), ORSTOM, Paris.
- MORAT Ph., MACKEE H.S. & VEILLON J.-M. 1984. — Floristic relationships of New Caledonian rainforest phanerogams: 71-128, in RAVEN P., RADOSKY F. & SOHMER S. (eds.), *Biogeography of the Tropical Pacific*. Association of Systematics Collections & Bernice P. Bishop Museum, Honolulu.
- MORAT Ph., JAFFRÉ T., VEILLON J.-M. & MACKEE H.S. 1986. — Affinités floristiques et considérations sur l'origine des maquis miniers de la Nouvelle-Calédonie. *Bull. Mus. Natl. Hist. Nat., B, Adansonia* 8: 133-182.
- MORAT Ph. 1993. — Our knowledge of the flora of New Caledonia: endemism and diversity in relation to vegetation types and substrates: 72-81, in *The Terrestrial Biota of New Caledonia*. Biodiversity Letters, London.
- MORAT Ph., JAFFRÉ T. & VEILLON J.-M. 1994. — Richesse et affinités floristiques de la Nouvelle-Calédonie: Conséquences directes de son histoire géologique. *Mém. Soc. Biogéogr.*, sér. 3, 4: 111-123.
- PARIS J.P. 1981a. — Géologie: Pl. 9. *Atlas de la Nouvelle-Calédonie* (carte + notice). ORSTOM, Paris.
- PARIS J.P. 1981b. — *Géologie de la Nouvelle-Calédonie. Un essai de synthèse*. BRGM, Orléans.

*Manuscript received 15 January 2001;  
revised version accepted 16 March 2001.*