

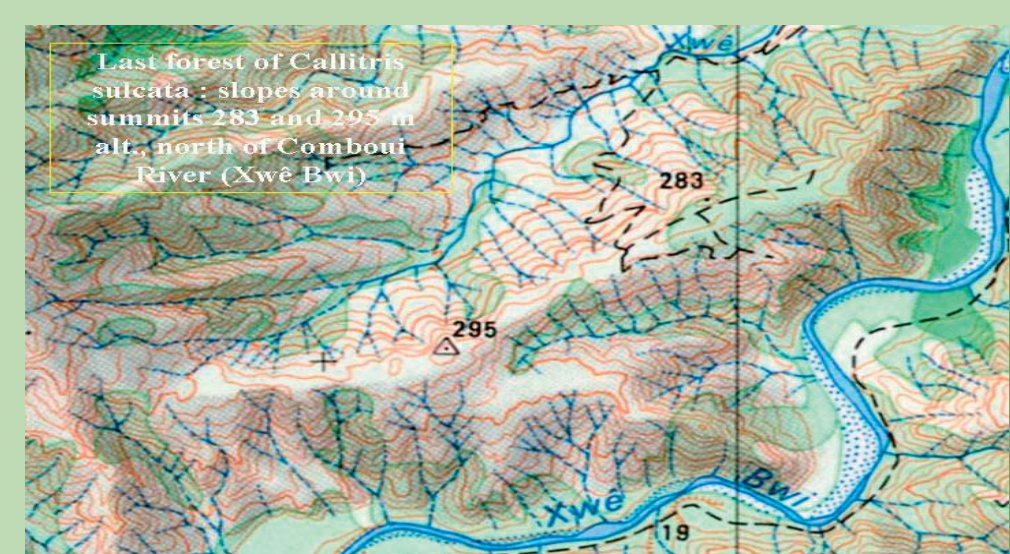
Protection needed for *Callitris sulcata*, an endemic but very threatened resource from southern New Caledonia

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Map 1



Map 2



Picture 1b



Picture 1c



Picture 1a

It can be seen in rare small spots of isolated trees and in one unique formation which still may be qualified as a forest, on the low Combou River (maps 1 & 2).

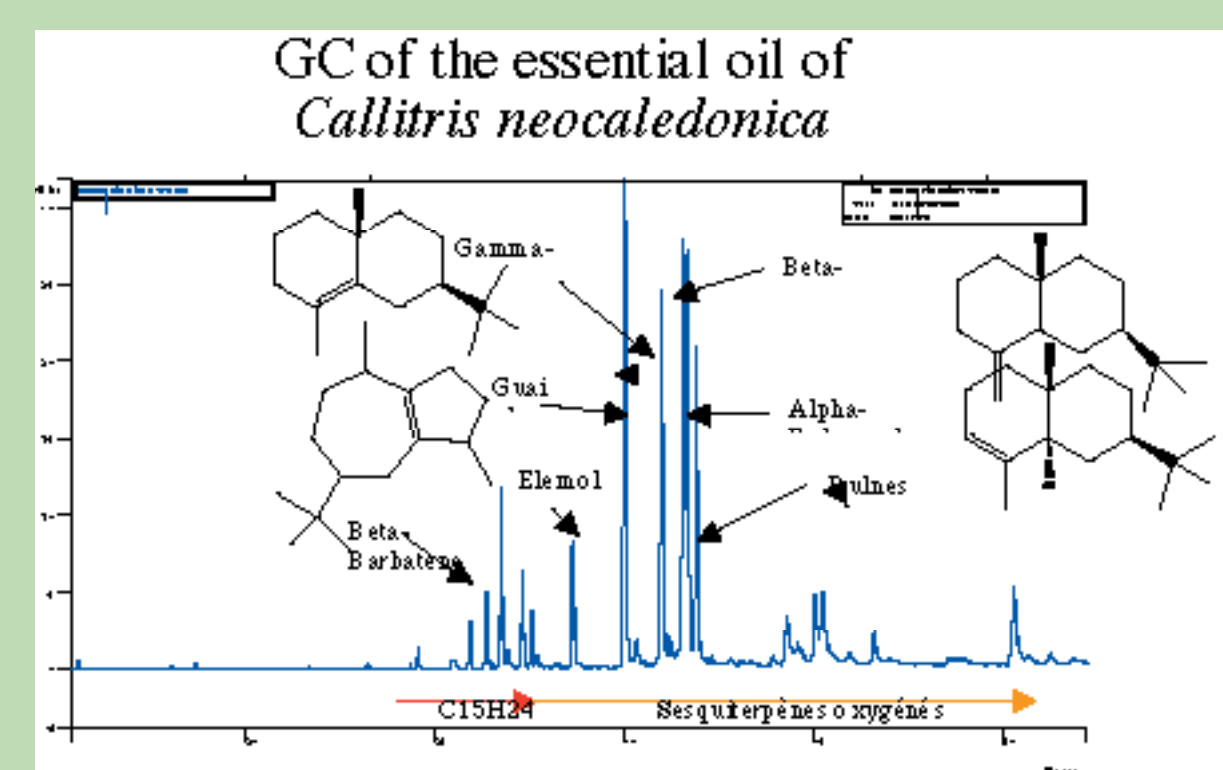


Figure 2

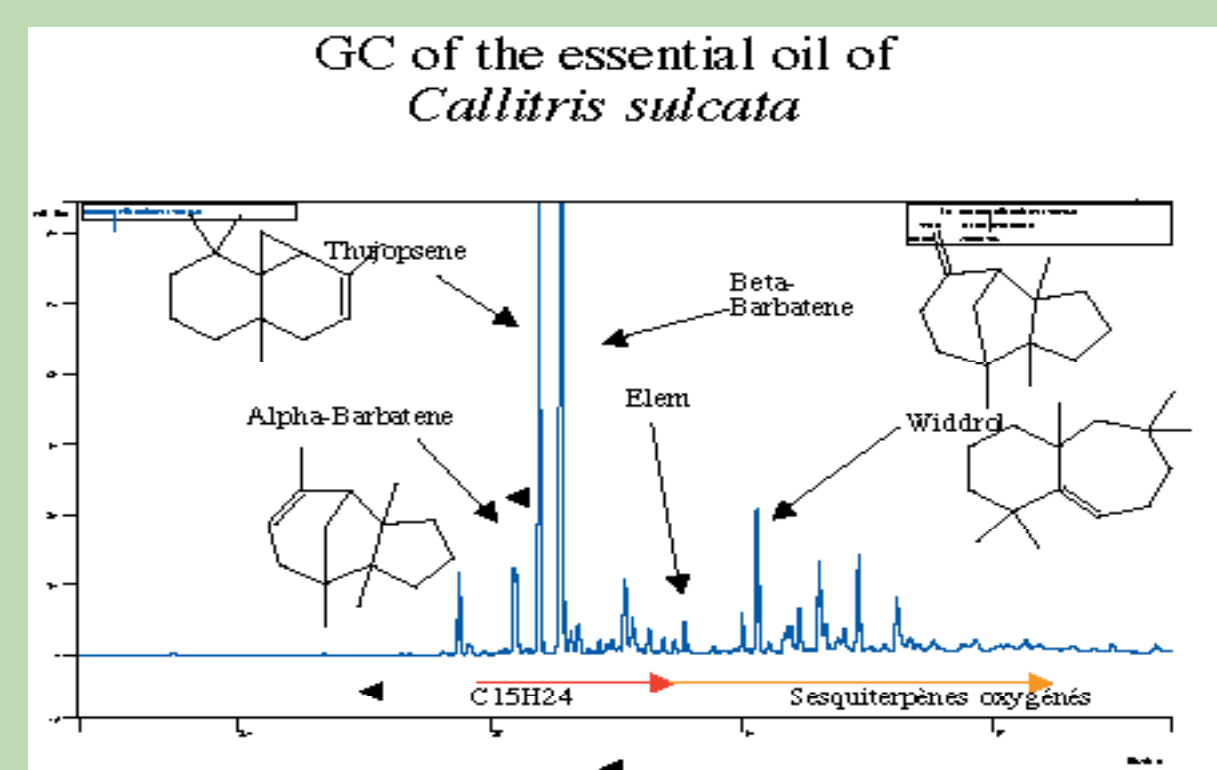


Figure 1

Callitris sulcata Schlechter (Parlatore) Schlechter, a low growing rare endemic Cupressaceae from the southern part of New Caledonia (pictures 1a, 1b & 1c), is distributed along three big rivers of the 'Massif du Sud' (Tontouta, Dumbea, Combou).

Recent studies made in the frame of the "Programme Plurivalorisation à Thio UNC - IRD" show it has an interesting potential as a resource in new natural bioactive substances (Carriconde 2001, Billo 2001).

New essential oils have been obtained by hydrodistillation of dead trunks of *Callitris sulcata*, also from dead parts of another endemic species of the same genus, *C. neocaledonica* Dummer, which grows at high altitudes in the same region.

Analyses evidenced the presence of rare and/or new natural compounds (figures 1 & 2); biological tests on the oil of *C. sulcata* have also shown activities against *Mycobacterium sp.* (unpublished results).

The quality of the wood is exceptional, especially in terms of durability, resistance to decay, to termites and to mould.

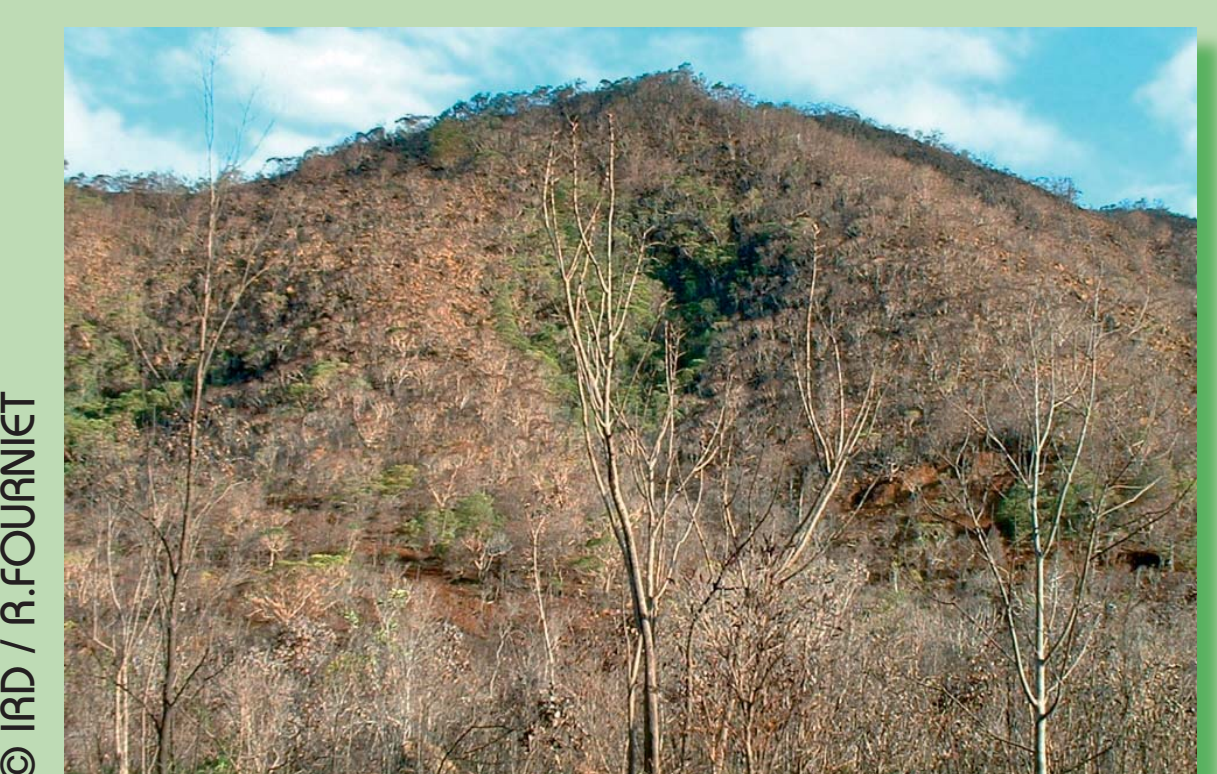
Traditionally it was used in the construction of wooden houses, as posts made of *gniè* (vernacular name of *Callitris sulcata* in *xârâguré* language, Thio region) are not subjects to rotting, not attacked by insects or fungi. Posts made of *gniè* are even recovered in old houses and used for new constructions. This use still remains.

Last century, *Callitris sulcata* wood was used in the building of the bell-tower of churches (Thio, Canala,..) and at the time when nickel mines were active in the region of Borendi in the confection of railway sleepers.

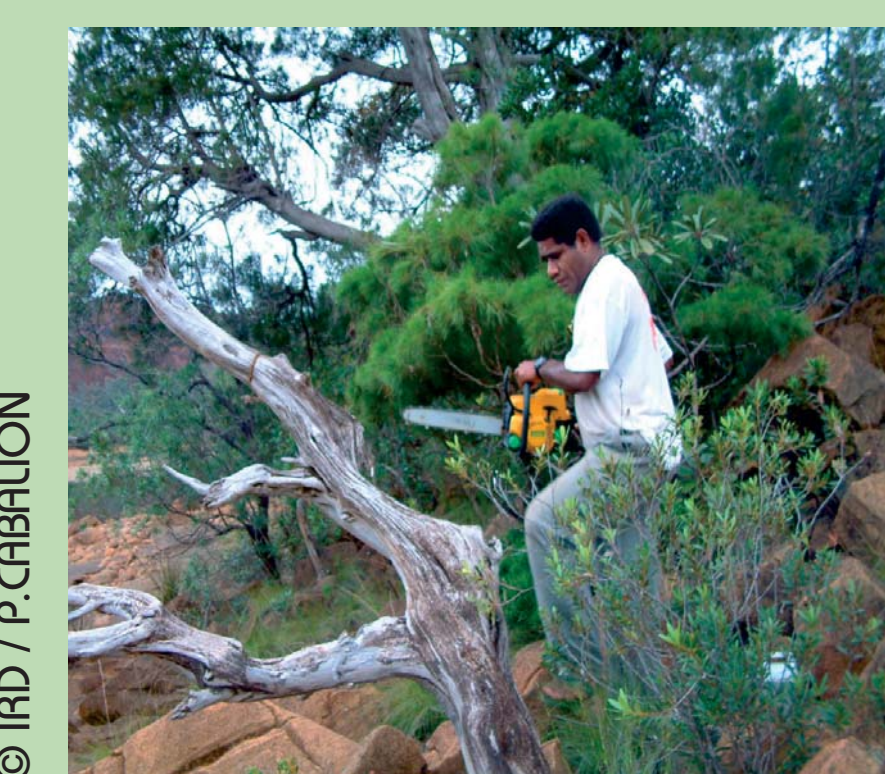
Recently, in a traditional sacred place located in St Joseph de Borendi, a monument was built (2001), in memory of the renovation of the church, and six barked trunks of old seed bearing individuals have been erected as permanent symbols of the six clans of the local tribe united with the church.



Picture 2



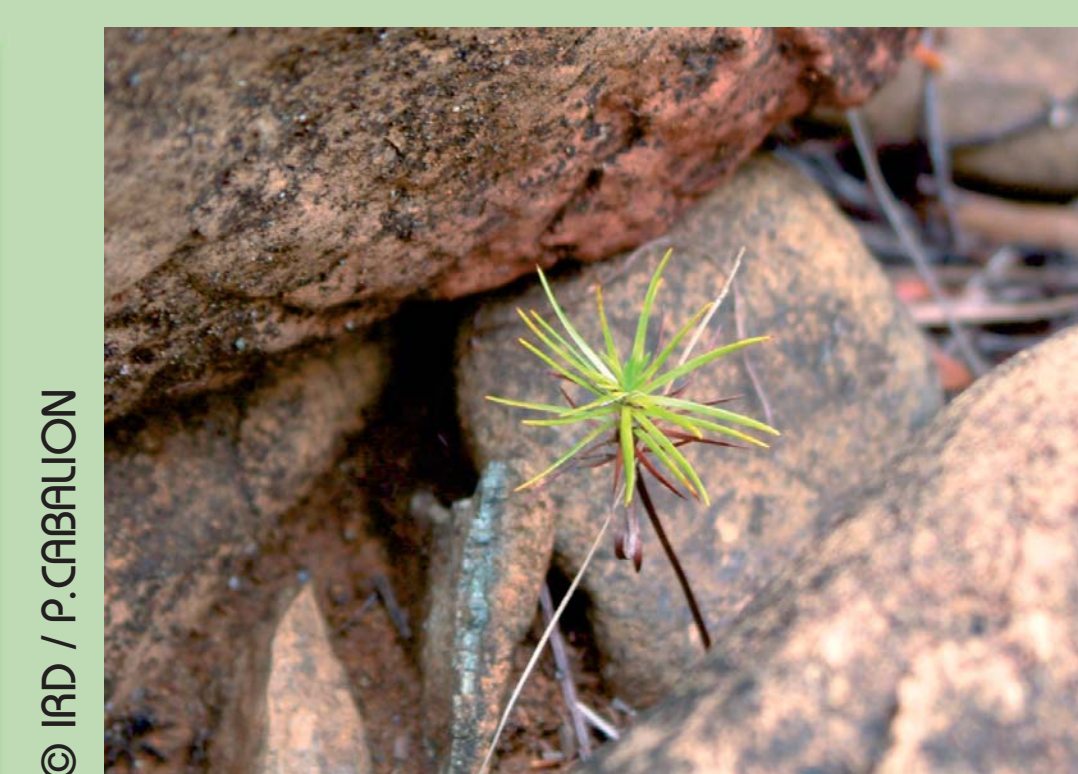
Picture 3



Picture 4



Picture 5



Picture 6



Picture 4

Present threats on the species:

Post making: Young trees with a straight trunk are still felled for making long-lasting posts, so the reduction of the population continues, especially in young trees arriving to maturity, which makes more hypothetical the chances of survival of the species.

Destruction by fire: Fires are also a main danger; a fairly big part of the last *Callitris sulcata* forest burned at the end of 2002 (pictures 2, 3 & 4). In 'ancient times', *gniè* trees existed in the slopes behind St Joseph de Borendi but has today completely disappeared, under the pression of overexploitation and fires.

Low germination and growing rate: At laboratory essays on a very small amount of seeds completely aborted. A datation of the old dead tree that we sampled (picture 8) was performed at the University of Arizona. A slice of the dead trunk sampled near the Combou River was sent for datation. The result is that it grew between ~1650 AD and 1955AD. The cause of the death seems natural, as no trace of fire was seen on remaining parts of the trunk.

Low survival rate of seeds and seedlings: Seeds are often attacked by parasites in the cones (Veillon J.-M, pers. comm.) (picture 1c). In natural conditions some seeds reach maturity and germinate: some very young *Callitris sulcata* were found under a mature seed producer (Picture 5 & 6), a tree growing on alluvions down to the lower right side of the Combou river. No medium sized individuals were seen, which shows that periodical floods regularly destroy these seedlings.

Ten of these seedlings were collected and replanted in Noumea, at IRD, 5 on enriched soil, 5 on a similar ultramafic soil from Ouenarou (near Rivière Bleue). 4 of the 5 seedlings growing on enriched soil died. The 6 remaining gained about half a centimetre in about one year (picture 7). It shows that the low growing rate of young *Callitris sulcata* makes them fragile and a long time depending on favourable ecologic conditions.



Picture 6



Picture 10

Conclusion:

Callitris sulcata is a potential resource in new essential oils (picture 9) and interesting new natural compounds, is locally regarded as a strong symbol of the Borendi tribal clans (picture 10), but the species is particularly threatened and its population continues to decline.

We recommend the status of this species should be changed from 'vulnerable' (Jaffré & al. 1998) (UN Island Directory 1989) to 'critically endangered'. Drastic conservation measures should be taken by local and provincial authorities. The conclusion is that a complete protection of the *gniè*, *Callitris sulcata*, is needed and that a drastic conservation plan should be undertaken.



Picture 9

Bibliography:

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