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Threatened Species Cont'd: The Brazilian Candela Plant (*Eremanthus erythropappus* (DC) MacLeish).

Modified (Feb 2009) from *Cropwatch Newsletter 8*.

The aroma-giant **Symrise** (formed in 2003 by the amalgamation of Dragoco & Haarman & Reimer, both situated in Holzminden, in the Lower Saxony area of Germany) announced in a sparkling piece of publicity that it is taking measures to protect the **candela plant** (Prance 2007), which grows in the Atlantic Brazilian rainforest, mainly south of Minas Gerias State. Ironically, these measures come after years of the plant's ruthless over-exploitation as a primary source of (-)-alpha-bisabolol, by the German pharmaceutical industry (Lopes *et al.* 1991). The natural isolated (-)-alpha-bisabolol has recognized skin healing & anti-inflammatory attributes (see Jellineck 1984). Lauterbach *et al.* (1992) of **BASF**, Germany, was granted a US patent for the purification of alpha-bisabolol from candela extract using a reduced pressure distillation process and lower distillation column outlet. **Symrise, Revlon & Rossman** are amongst those 187 companies (according to the Mintel data-base) to have launched cosmetic products containing (-)-alpha-bisabolol, in spite of candela's somewhat precarious ecological situation.

The natural occurrence of alpha-bisabolol is, however, not just confined to the candela plant – it also occurs in German chamomile. *Chamomilla recutita* (L.) Rauschert, Horehound oil *Marrubium vulgare* L., Phoebe oil *Phoebe porosa* Mez. etc. (Burfield 2007). Schultz (2003) of the former Dragoco company discusses the fact that for pharmaceutical and cosmetic products, chamomile essential oils with the highest alpha- bisabolol content and a very low content of bisabolol oxides are preferred. In a further article (Braun *et al.* 2003) we are told that the known sources of (-)-alpha-bisabolol are *Chamomilla recutita*, *Vanillosmopsis erythropappus* (syn *Eremanthus erythropappus* & *Vanillosmopsis arborea* (for *V arborea* e.o. composition - see Creivero *et al.* 1996), but that commercially, (-)-alpha-bisabolol is only isolated from the steam distilled wood oil of *Vanillosmopsis erythropappus* (Carle 1996). where it occurs at 0.1%, or more rarely at up to 0.5%. Isolating alpha-bisabolol seems to be a high carbon footprint process considering that, for example, Curado *et al.* (2006) report that the folk-medicinal Brazilian plant *Lychnophora ericoides* contains up to 76.4% alpha-bisabolol..This is the reason that it is only economic to harvest candela trees for

alpha-bisabolol which are 12 to 15 years old. Yet in spite of the disadvantageous economics, **Agipal** claim that their alpha-bisabolol, isolated from candeia trees, is eco-certifiable. Prance (2007) indicates that **Symrise** will be working with other Brazilian partnership firms to help support & finance a project conducted by the Universidade Federal de Lavras, which aims to optimise growing conditions for the plant (**Cropwatch comments**: Lets hope this University-Industrial alliance doesn't become another disaster like the Rosewood oil cultivation situation). The above institution has already published a study on a management system for native candeia forest (Scolforo *et al.* 2004a), and oil contents of candeia wood, branches & leaves (Scolforo *et al.* 2004 b). In another forest management study, Prerez *et al.* (2004) have already indicated that the commercial exploitation of candeia for fenceposts, and essential oil by-product is only feasible where the predominance of candeia spp. constitute >70% of the vegetation. In the applications area, interesting research on a synergistic effect (as estimated by time-kill data), between ampicillin & the essential oil of *Eremanthus erythropappus* or beta-bisabolol contained within the oil, against *Staphylococcus aureus*, has been published by Nascimento *et al.* (2007). It was also found that both the essential oil & beta-bisabolol have the potential to restore the effectiveness of ampicillin against resistant *S. aureus*.

Update 2008.

In an update to the conservation situation, Abreu (2008) reports farmers from 6 cities in the state of Minas Gerais are helping with the reforestation of degraded areas and the preservation of important spp. such as *Eremanthus erythropappus* (note: spellings of 'erythropappus' vary in the literature). The project includes the partnership of German & Brazilian governments, the Federal University of Lavras (UFLA) & others. Mônica Lopes Bueno, director of Amanhãgua Civil Society for Public Interest (Oscip), also a partnership member, reports that 200 farmers are growing candeia, compared with 80 in 2007. Charles Plínio de Castro Silva of UFLA is reported as saying "all the cosmetics that have chamomile in their composition may use candeia oil instead". Since several physiologically components of chamomile oil are not found in candeia oil, this sounds like a scientifically unsafe pronouncement, but the Brazilian company **Natura** is said to be working on this prospect.

Technical notes:

1. MacLeish (1987) discusses the revision of the *Eremanthus* noting that taxonomic distinctions between *Eremanthus* & *Vanillosmopsis* are largely artificial. Therefore the Candeia plant can have several botanical namings
2. The chemical variability of *Eremanthus erythropappus* has been examined by Lopes *et al.* 1991. The authors interpreted occurrence of aberrant bisabolol-poor species as "a case of micromolecular diversity of sympatric species." ...err....absolutely!

References.

Abreu C.A. (11.11.2008) "Educating for reforestation." Sao Paulo: Brazil-Arab News Agency

Burfield T. (2007) from the forthcoming 2nd edition *Natural Aromatic Materials – Odours & Origins*.

Carle R. (1996) "Kamillenol - Gewinnung and Qualitätsbeurteilung." *Dtsch. Apoth. Ztg.* **136**, 2165-2176..

Craveiro A.A., Alencar J.W., Matos F.J.A., Sousa M.P. & Machado M.I.L. (1989) "Volatile constituents of leaves, bark and wood from *Vanillosmopsis arborea* Baker." *J. Essent. Oil Res.* **1**, 293-294.

Curado M.A., Oliveira C.B., Jesus J.G., Santos S.C, Seraphin J.C. & Ferri P.H. (2006) "Environmental factors influence on chemical polymorphism of the essential oils of *Lychnophora ericoides*." *Phytochemistry.* **67**(21), 2363-9.

Jellinek J.S. (1984) "Alpha-bisabolol un agent anti-inflammatoire pour produits cosmique." *Parfums Cosmet. Aromes* **57**, 55-57.

MacLeish N.F.F. (1987) "Revision of *Eremanthus* (Compositae: Vernoniaeae)" *Annals of the Missouri Botanical Garden* **74**(2), 265-290.

Nascimento AM, Brandão MG, Oliveira GB, Fortes IC, Chartone-Souza E.(2007) "Synergistic bactericidal activity of *Eremanthus erythropappus* oil or betabisabolene with ampicillin against *Staphylococcus aureus*." *Antonie van Leeuwenhoek* **92**(1), 95-100.

Pérez J.F.M, Scolforo J.R.S., de Oliveira A.D., de Mello J.M., Borges L.F.R., Camolesi J.F. (2004) "Management system for native Candeia forest (*Eremanthus erythropappus* (DC) MacLeish) - the option for selective cutting." *Cerne*, **10** (2),257-273.

Prance L. (2007) "Symrise up efforts to save alpha-bisabolo (sic) production." - see <http://www.cosmeticsdesigneuropa.com/news/ng.asp?n=77098&m=2CDE607&c=mbslkouyzvdsosv>

Scultz H. "Utilisation of plant genetic resources for valuable raw materials in foods, cosmetics, and pharmaceutical products." *Schriften zu Genetischen Ressourcen*, 2003 - genres.de

Scolforo J. R. S., Oliveira, A. D. de, Mello, J. M. de, Pérez, J. F. M., Camolesi, J. F., Borges, L. F. R. (2004) "English Title: Management system for native candeia forest (*Eremanthus erythropappus* (DC) MacLeish) - the option for selective cutting." *Cerne* **10**(2), 257-273).

Scolforo, J. R. S., Oliveira, A. D. de, Mello, J. M. de, Acerbi Júnior, F. W., Pérez, J. F. M., Camolesi, J. F., Borges, L. F. R. (2004) "Volume estimation, dry weight, oil content and quantity of fenceposts of candeia (*Eremanthus erythropappus* (DC) MacLeish)". *Cerne* **10**(1) 87-102.