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Sandalwood Update (2006).

by Tony Burfield 2006..

Another historically sequenced article from the archives illustrating the general realisation that strange forces were operating in the sandalwood business...

It has been puzzling many of us exactly what is going on with Sandalwood oil EI – suspicious as ever, some of us old hands suspect that some batches of oil are being adulterated in new ways which we haven't yet fathomed!

Sandalwood Oil East African *Osyris lanceolata* Hochst. & Steud.

No – not the Sandalwood East African material deriving from Tanzanian *Osyris tenuifolia* Engl. (“bastard sandalwood”) which has lanceol as its principle component! It was somewhat surprising for us to learn at this point that there is a new kid on the block in the form of **Sandalwood oil East African** from *Osyris lanceolata*. The scented wood from this 8-10m. tree native to S. Africa, makes an interesting oil, having an initial strong sickly sweet note which rapidly gives way to a metallic-rubbery-woody note slightly reminding of Cedarwood. The profile lacks the sensuality of E.I. Sandalwood oil. The dry-down is a smooth somewhat sweet creamy woody note, much less crude and more pleasant than the top note and more similar to E.I. Sandalwood, but as noted for the top note, still lacking the sensual quality of E.I. Sandalwood oil. Its highish concentration of sanatols (probably 32% max) and high santalyl acetate content (approx 35% typical) may make it seem an attractive proposition to some.



(+)-Z-alpha-santalyl
acetate

Apparently 150 tons of logs of *Osyris lanceolata* per month are being imported into India by a company in Mumbai (which claims to be the largest importer) – and who's literature states sales of oils, chips, powder etc. are made into

chewing tobaccos, attars, perfumery and the agarbatti/joss-stick industries. The company admits also to producing between 750-800 Kg of East African sandalwood oil per month (Banker 2004). However the sustainability of this practice is far from clear - reports of the threatened status of *Osyris lanceolata* in the Eastern Arc mountains of Tanzania can be viewed at <http://global.finland.fi/julkaisut/group 3.htm>. Further, a report on oil on the resource status of *Osyris lanceolata* in Tanzania and oil quality variation amongst endemic trees populations by Mwang'ingo, P.L. et al. can be viewed at <http://www.inasp.info/ajol/journals/safi/vol199abs.html>. From these reports the situation would seem to show cause for concern.

Ref: Banker R (2004) Personal communication to author.

Sandalwood oil New Caledonian *Santalum austrocaledonicum* Viell. var. *austrocaledonicum*.

Now being promoted and sold by several essential oil companies, it remains to be seen how long this source, previously reported to be threatened, will last. So what do we know?

We know that sandalwood trees (*Santalum austrocaledonicum*) which grow from 5-12m. and may reach 30-45 cm. in girth, are widespread on the Isle of Pines and in the Loyalty islands around Noumea and to the north of the main island. On Grande Terre it only occurs in a few restricted areas (SPRIG 2000). We also know from the same source that three varieties are distinguished *S. austrocaledonicum* var. *austrocaledonicum*, *S. austrocaledonicum* var. *pilosulum*, *S. austrocaledonicum* var. *minutum*, and that morphological and oil content differences occur between *S. austrocaledonicum* var. *austrocaledonicum* trees on Loyalty Island and “the Ile des Pines” provenance. We also know that subspecies of *Santalum* species might show some variations sesquiterpenoid composition, however *S. austrocaledonicum* oils from several geographic locations are known to be able to pass the ISO 3518 criteria for Sandalwood oils, although the optical rotation criteria may be a stumbling block.

New Caledonia was reported as having 360,000 hectares of forest land but only 10,000 under cultivation ref: www.fao.org/DOCREP/004/Y1997E/y1997e19.htm As the European Forestry Institute points out at <http://www.efi.fi/cis/english/creports/vanuatu.php> “In general, current timber export markets in Asia and New Caledonia do not require information on the environmental standards and impacts of logging operations”. This is important because energy intensive steam distillation of small charges (250-300Kg) of sandalwood chippings or shavings to produce the sandalwood crude oil (this crude grade is being sold into aromatherapy), take up to 2 days to complete and thereby generate relatively large amounts of carbon emissions per kilo of oil, contributing to the overall negative ecological impact of the operation. As several minor Pacific Islands are currently being submerged through the effects global warming, this is a sensitive issue. **Cropwatch** has been making representation to Australian entrepreneurs in the Pacific connected with Sandalwood exploitation suggesting that the implementation of solar distillation rather than importing

diesel to generate steam would perhaps help reduce this negative impact, however it is to be remembered that Australia is not a signatory to the Kyoto protocol and has little internal pressure to act in a deep green ecological manner. It is also to be remembered that Oceania itself causes a huge carbon emission loading to the world atmosphere which can only be added to by diesel or wood-fired distillation processes.

Cherrier (1993) reported on the difficulties of sandalwood cultivation in New Caledonia noting heartwood development was proportional to proper development (fast growing trees producing less heartwood). On the narrower subject of sustainability, Ehrhart (1997) presented a fairly optimistic report on the status of known consistent sandalwood stocks in New Caledonia (in contrast to the depleted situation in many/most other South Pacific locations), and makes the point that surveyed sustainable logging management should be possible in these circumstances (yearly quotas have been set at 55 to 60 tons of wood). However, apart from illegal cropping & fire damage, the danger is that of over-exploitation – the bio-resources of New Caledonia to supply Sandalwood oil are unlikely to be able to supply more than a few percent (i.e. probably no more than 2 tons max.) of the total Sandalwood oil demand – which will be severely tested now that leading French aroma houses are currently offering oil from this origin. Further, as indicated above, whilst the emphasis in the sales propaganda by Sandalwood oil salesmen has largely centered on examining tree sustainability, the negative aspects concerning the total environmental impact of the operation can easily be overlooked.

Santalum album plantations Australia

At the time of going to press, a report about the lack of any impact assessment study ever being carried out, and a statement concerning economic failure of investment schemes for *S. album* plantations have had to be held over for a future issue. Meanwhile mailed comments on the status of *Santalum* spp. in Australia covered in Cropwatch 2 have been received by the author from two senior Australian Forestry officials, who have unfortunately declined permission to have their observations reproduced here

References.

Cherrier, J-F, 1993. "Sandalwood in New Caledonia". In F.H. McKinnell (ed) *Sandalwood in the Pacific Region. Proceedings of a symposium held on 2 June 1991 at the XVII Pacific Science Congress*, Honolulu, Hawaii. Canberra: ACIAR Proceedings No.49. pp19-22.

Ehrhart Y. (1997) "Descriptions of some Sandal Populations in the South West Pacific: Consequences etc." *ACIR Proc.* **84**, 105-112.