



A portable still is generating cash from trees for a village in Papua New Guinea's Western Province.

## Seeds of an oil-based economy sown in PNG

Studies of leaf oils in the Western Province of Papua New Guinea by researchers from CSIRO's Australian Tree Seed Centre (ATSC) have led to successful pilot-scale production and marketing of an essential oil with valuable medicinal properties.

Regular seed collecting expeditions to this remote lowland region began in 1981 in line with the centre's goal of collecting seed throughout the range of Australian tree species and those shared with neighbouring countries. The seed collections in PNG are done in partnership with the PNG Forest Authority. In the early 1990s, the work was extended to cover leaf oils, with a small portable still used to extract these on the spot.

Leader of the project, Dr John Doran, says the oil extraction sparked interest among the local people. They saw that leaf oil distillation could provide an opportunity to generate a cash income, as it has for villagers over the border in Irian Jaya, Indonesia. PNG's Western Province is disadvantaged due to its remoteness, and various attempts over the years to establish income-generating industries – including rice and rubber production and crocodile and deer farming – have failed.

Responding to their requests for help, ATSC arranged for an Australian expert in leaf oil production, Geoff Davis of GR Davis Pty Ltd, to make an exploratory trip to the region, design and build a still suited to local conditions, and train the villagers to use it. The PNG Biological Foundation provided financial support.

Among requirements for the still's design were that it should be large enough to produce a worthwhile amount of oil, but at the same time easily taken apart and reassembled, with portions small and light enough for people to carry through the dense bush.

Another was that it should fit into the light aircraft chartered for the trip to the village of Bensbach, its destination in the Western Province. To the temporary consternation of the team it nearly failed this test; a hatch had to be removed before all parts could be eased inside.

Since being set up in the village in April 1996 the stainless steel still has performed to expectations, producing a steady flow of cineole-rich oil from the leaves of *Asteromyrtus symphyocarpa*, a tree until recently considered part of the *Melaleuca* genus. A major advantage of this species is that it coppices profusely. 'You get quick regeneration, which means the industry should be sustainable,' Doran says. 'You can come back annually to harvest the coppice shoots.'

The local name for the tree is waria-waria, and the villagers bottle the product as Waria-Waria Oil. 'They claim the oil offers relief from many of the common ailments that abound in tropical environments,' Doran says. 'Basically, it's a medicinal eucalyptus oil; the tree is closely related to eucalypts. It's an antiseptic that can be used to good effect on cuts, and the people use it externally to treat coughs and colds, and aches and pains.'

So far, Waria-Waria Oil is sold only in the Western Province, including at the market in Daru, the regional centre, where a 50 ml bottle sells for about A\$5. Development of the industry beyond the current pilot scale will require substantial funding support, including for the construction, preferably locally, of more stills. Further research is required on questions such as the extent of the *A. symphyocarpa* resource, the trees' long-term regeneration capacity, other species offering high-quality oils, and a range of issues relating to land tenure and rights of access.

Doran says leaf oil production offers major benefits to the Western Province as an income-generating industry. It will be community-based, sustainable and, once established, self-sufficient. Also, importantly, the local people recognise its potential and are keen to become involved.

The next stage of the project, scheduled for later this year, will involve setting up two more locally-made stills in different villages. Doran would also like to more intensively survey the oils of other tree species in the region, as some have shown commercial potential in preliminary screenings.

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