

# Red Sanders





## Extent and Geographical Distribution

*Pterocarpus santalinus* occurs in the forest formation which is classified as "5A/C3 Southern Tropical Dry Deciduous Forests" as per Champion and Seth Classification and falls in the eco-terrestrial region IM1301 Deccan Thorn Scrub Forests and as well as IM0201 Central Deccan Plateau Dry Deciduous Forests. It is generally found at altitudes of 150 - 900 m. It grows on dry, hilly, often rocky ground, and occasionally found on precipitous hill sides also. It prefers lateritic and gravelly soil and cannot tolerate water logging. In natural habitat the tree experiences hot, dry climate with normal rainfall of 88-105 cm received from north-east and south-west monsoons.

The principal tree association is *Pterocarpus marsupium*, *Chloroxylon swietenia*, *Terminalia chebula*, *T. tomentosa*, *Albizia lebbek*, *Hardwickia binata*, *Anogeissus latifolia* and *Dalbergia latifolia*. Red Sanders many times occurs gregariously as pure patches also.

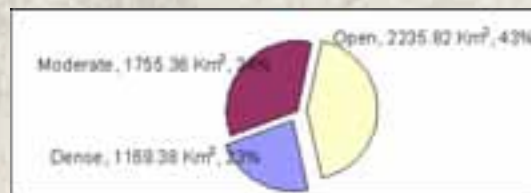
### A view of the Red Sanders bearing Forest



Red Sanders has a highly restrictive distribution in the South Eastern portion of Indian peninsula to which it is endemic. The Palakonda and Seshachalam hill ranges of Cuddapah-Chittoor districts of the State of Andhra Pradesh are its principal geographical range which extends slightly into the neighbouring Anantapur, Kurnool, Prakasam and Nellore Districts of Andhra Pradesh. Sporadic wild populations occur in the adjoining districts of the neighbouring states of Tamil Nadu & Karnataka.

The Red Sanders bearing formations are estimated to extend over approximately 5160 Km<sup>2</sup> in its principal geographical range. About 23% of the Red Sanders formation is dense, 34% has moderate cover and the remaining is open. The distribution is indicated in Chart.1, below.

Chart.1 Density class wise distribution of the Red Sander bearing Forests in its principal geographical range

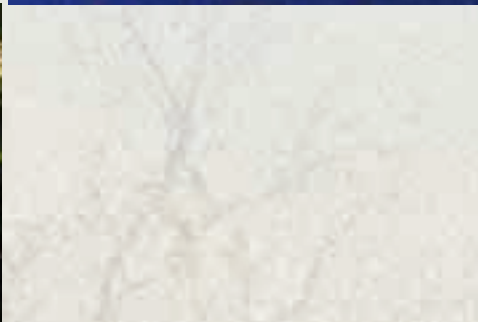
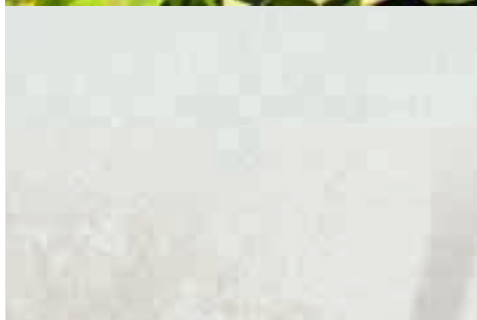






## Morphological Characteristics

10-11 m high; bark blackish brown, leaves imparipinnate, leaflets pulvinate 3, rarely 5, with somewhat whitish undersurface. Flowers bright yellow in short racemes consisting 25±4 members, pedicellate, 16mm long, bisexual, zygomorphic and mildly odoriferous.



Calyx tubular near the base becoming free towards apex, corolla consists one standard, two winged and two keeled petals, stamens in two bundles of five each, anthers ditheous. Ovary consists of two ovules. Pods about 5 cm in diameter, winged with one or two seeds in each. Seeds about 1 to 1 ½ cm long, dolabriformis, coriaceous, reddish brown.

### Biological Characteristics

A moderate sized deciduous tree with erect bole and dense rounded crown, conspicuous by its blackish brown bark resembling the skin of crocodile, divided into rectangular plates by deep vertical and horizontal cracks. A blaze on the bark exposes the white coloured sapwood which gradually turns red due to exudation of a red gummy juice. Heartwood is deep red in colour which on exposure turns to scarlet red. Population level flowering occurs during April-June with individuals flowering intermittently for a period of 3 weeks some times resulting in a mass blooming. Pods form rapidly but ripen only the next February-March. Pollinator activity is limited to moonlit nights and early morning hours.



The natural fruit set is very low about 6% comparative to the quantum of flowers, with xenogamous fruits alone carrying to maturity and dropping of autogamous and geitonogamous. The various factors could be low possibility of energy investment due to the climatic and natural limiting factors during seeding, progressive elimination of poor seeds arising out of self pollination, less probability of outcrossing due to limitations of population size, pollinator availability etc. Population size thus appears to be of crucial importance for continued survival. The pods fall in May and germinate with the onset of monsoons in July. The species exhibits the temperament of a struggling gambler with the shoot dying back many times due to drought, browsing, competition from gamblers etc, till the time the root gains vitality enough to propel the shoot upwards fast in a heliophilous mode. The tree starts shedding its leaves by early January and by the end of February becomes totally leafless. Well before other trees of the area, by early April, the tree puts out young leaves.





## Parts & Products

### Parts and Derivatives in trade

Logs, wood chips, sawn timber, extracts, dyes. The extent of the sectoral demand in the international trade is not clear. Seizures have been principally of logs both domestically and at international exit points. There have been very few interceptions of other forms such as musical instrument parts, sawn timber etc., domestically.



### Musical Instruments

Red Sanders is said to be used in the making of oriental musical instruments like Shamisen, *Koto* and *Erhu*.

Photos of Musical Instrument Parts of Shamisen



## Characteristics of Demand

### National utilization

Extraction of living trees from the natural forests is prohibited and silvicultural removals if any are as per the prescriptions of the approved Working Plans. In the protected areas, removals of any kind are prohibited. Legal trade is limited to occasional sale of confiscated timber by the Government of Andhra Pradesh. The species has negligible utilization within the country mainly in Ayurvedic pharmacopoeia and some times for making small toys. The species has virtually no domestic demand for constructional or furniture use. Almost all the seizures indicate the movement of logs towards the exit points or the seizures themselves are at the exit points during attempted smuggling. An analysis of the seizures occurred during last 5 years indicates that about 90% of the logs seized confirming to 50 to 90 Cms g.u.b while remaining 10% were between 100 to 120 Cms g.u.b.

### Actual or Potential Trade Impacts

The illegal trade adversely affects the population structure of the species with the removal of superior phenotypes. It is further aggravated by the special demand for wavy grained individuals which cannot be determined by any observable morphological parameters, causing indiscriminate fellings. The alternative use of the non-wavy grained individuals for the valuable extracts and dyes sustains the interest of the feller even if he fails to find wavy grain.

The extent of the range of end uses for the timber is not fully clear and hence it is difficult to determine as to which sector of demand is fuelling the illegal trade. The species with xenogamous seed production mechanism is dependant on the overall population size as well as the availability of superior pheno/genotypes for generating sustained good quality seed. Failure to do so may adversely affect the important regeneration mechanism through quality seed, leaving only the coppicing mode for the survival of the species.





## Identification

### 1. Physical Properties

#### Physical Properties

\* Heartwood **red** to **purple** brown upon exposure turning dark brown or black.

\* Specific gravity of Red Sanders and some of the look alikes are given below:

Sl.No.	Species	Specific Gravity
1	<i>Pterocarpus santalinus</i> (Red Sanders)	0.97
2	<i>Pterocarpus dalbergeoides</i> (Padauk)	0.62
3	<i>Pterocarpus indicus</i> (Bijasal)	0.67
4	<i>Dalbergia latifolia</i> (Rosewood)	0.66

\* Water extract is light **orange** brown and fluoresces with a light **blue** colour

**The undressed logs exhibit a rough bark somewhat resembling crocodilian scales**





Under the bark, a white coloured sapwood exists



Upon dressing reveals a deep scarlet coloured heartwood



The wood anatomy of Red sanders and the look alike species

Species	Cross Section1	Cross Section2	Tangential Section
Pterocarpus Santalinus (Red Sanders)			
Dalbergia latifolia (Rosewood)			
Pterocarpus dalbergioides (padauk)			
Pterocarpus marcupium (Bijasel)			





A moist chip of wood leaves a **reddish** colour scar on a **white** cloth when rubbed upon



**Grading Rules:** The Andhra Pradesh Forest Department prescribes the following general standards for the Red Sanders logs from commercial perspective:

- \* Logs to be dressed nearly upto heartwood
- \* Straight or nearly straight
- \* Minimum length of 75 Cms
- \* Top end girth of 36 cms or above.

The logs are further graded into A, B, C or Non-Grade according to the following characteristics.

**A-Grade**

- \* **Sound or nearly sound with few or no defects**



\* Surface gives a ripple reflection





### **B Grade**

- \* Semi-sound A grade logs with more defects
- \* A grade logs with bends
- \* Logs sound or semi-sound with some defects



- \* Logs with medium long and medium deep wavy grain clearly visible



### **C-Grade**

- \* Long and shallow wavy grain or straight grain
- \* logs sound or semi-sound with some or no defects
- \* Un-sound but utilizable A-grade logs with many defects
- \* Un-sound but utilizable B-grade logs with many defects







Non Grade</H2  
\* Un-utilizable logs of all grades



## Comparison of different grades of logs Visual Comparison



### Accoustic Comparison

The logs when hit by a small hammer produce sounds of varying accoustic quality depending on the grade which in turn depends on the quality and arrangement of wood fibres.

The group of sounds starts with Grade A followed by B & C, in the accompanying sound clip. Observe the change in pitch and resonance from A to C.







## **Criminality**

### ***Modus Operandi:***

Qualitative shift in trends: Of late the following trends are indicated.

- \* Largely Musical Instrument Parts throughout 90's
- \* Currently overtaken by Logs
- \* smuggling of cut to size pieces of Red sanders and semi finished parts of musical instruments

### **Domestic**

Smuggling by hierarchical criminal groups through the following stages

- \* Stage-1:- Certain Traders / Middlemen on behalf of the Traders stationed elsewhere (Chennai etc) contact some middlemen in medium towns near the forest areas and pay them advances to organize cutting of wood .
- \* Stage 2:-The Middlemen contact the locals and pay them advances for going to the Forests, cutting Red Sanders trees and bringing the timber logs form the Forests. The locals are paid by weight and the rate varies any where from Rs.20/- to Rs.40/- per Kg based on the market demand.
- \* Stage 3: Several cycles of transportation and laundering often changing ownership, locations, conveyance and drivers through middlemen.

### **Concealment in agricultural field and under some agricultural produce**



- \* Stage 4:- Final transport of Red Sanders logs normally concealed under some agricultural produce or under animal dung or rotten onions and transport to Chennai or other places by road.
- \* Stage 5:- The material either in log form or in converted form is transported to various destinations with in the country or outside the country.

Vehicles Used

### **International**

#### **Exit Point Vulnerability Analysis**

Borders with Nepal and Myanmar appear to be currently active with reference to smuggling of Red Sanders. Amongst the exit points the forms vary as below: \* Land Frontiers – Logs

- \* Air – Purportedly Value added forms
- \* Sea – Logs, Purportedly valued added forms
- \* ICD – A New front, Logs

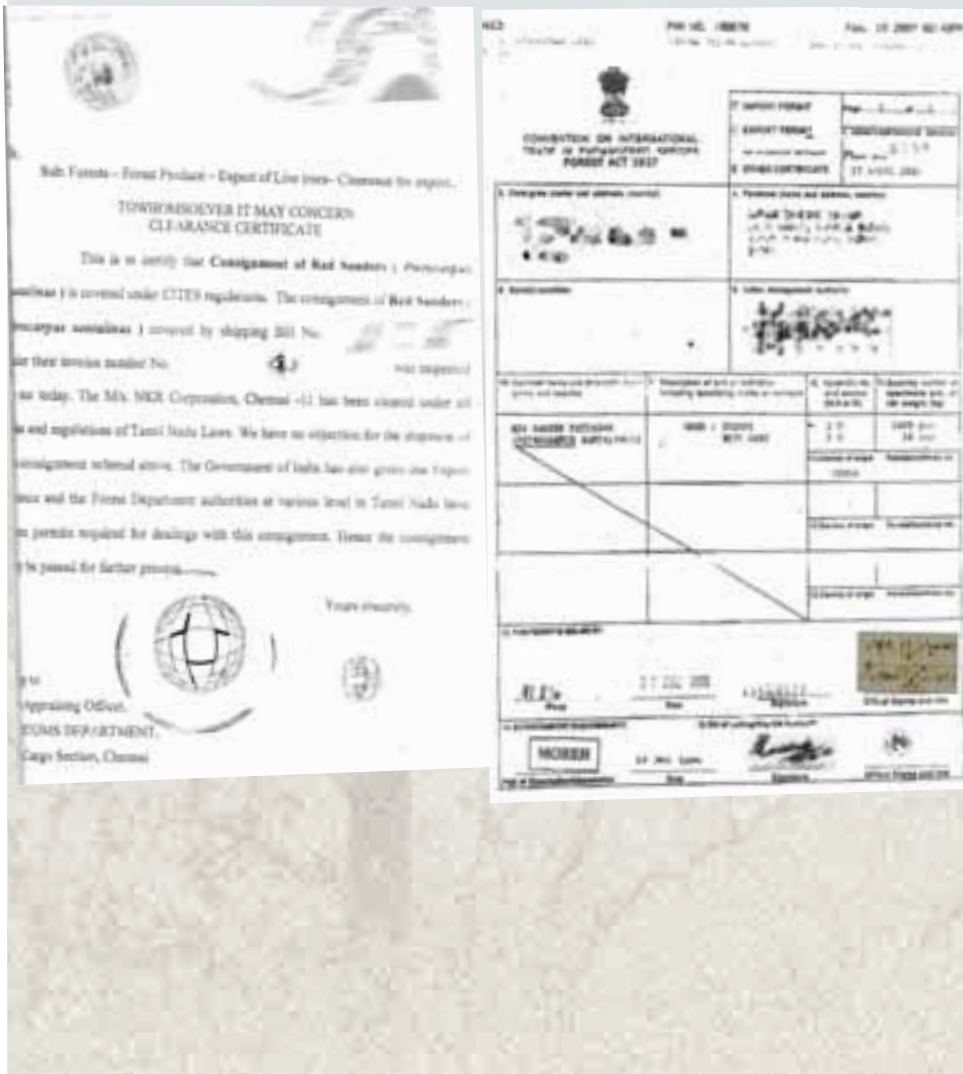


**Improper Documentation**

- \* Fake / Altered Transit Permit / Certificate of Origin
- \* Fake / Altered CITES Documentation-Removal of additional sheets to beat quantitative sealing
- \* Documents from authorities not competent or not having original jurisdiction

**Documents from authorities not competent or not having original jurisdiction**

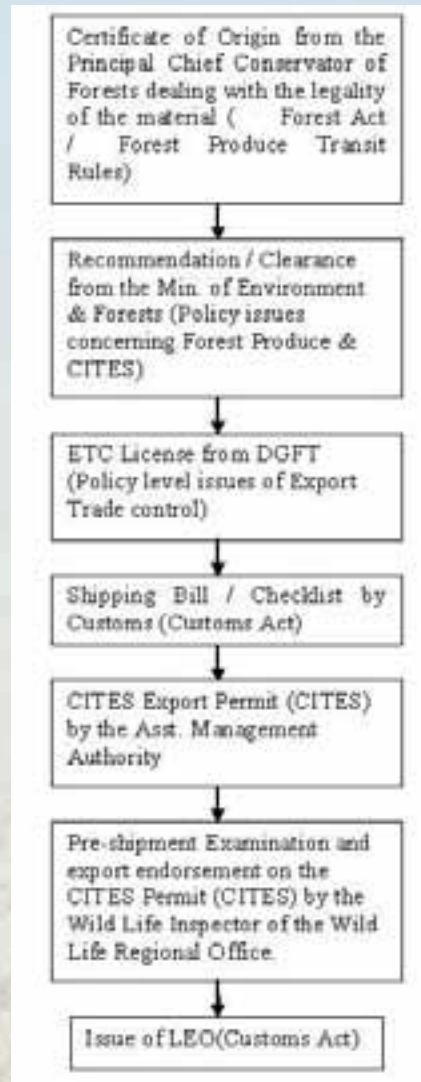
**Fake CITES Permit**





### Methodology for Legal Export of Red Sanders

The export of Red Sanders in all forms including extracts and other derivatives involves broadly the following seven processes.



Each of the above is a specialized process with specific scope and mandate under a specific law. Further each step is linked through a conditionality of necessity but not sufficiency to the subsequent step in view of the specializations. For example, a Certificate of Origin is necessary for issuing of a recommendation / clearance to the DGFT, but not sufficient, meaning that the completion of an earlier process is essential but does not automatically enable completion of the next stage process. Each specialist enforcer has to thus look for completion of the prior processes before examining the export proposal from his own specialized perspective.

### **Some Action Points for Enforcers**

In view of the species having purely transnational demand, exit point control represents the most important enforcement strategy.

- Better regulation of Factory stuffing especially in respect of first time consignors and by regular consignors, but at unusual locations
- Mandatory examination for correct species identification of consignments of wooden articles irrespective of species declared by consignor
- Examination of handicrafts / MI parts to check whether they really represent such musical instrument parts/handicrafts or just morphs of sawn timber
- Issue of Certificate Of Legal Origin with reference to the end product proposed for export and not just the purchase of logs/chips etc in raw form at the time of auction prescribing a definite time period of validity for COO
- Exchange of information on COO's granted by various State Forest Departments with exit point agencies.
- Thorough scrutiny of the legality of the end produce and its form, not just the procurement of logs, before recommending the grant of clearance/license and such documentation to have photo and detailed description of handicraft articles being permitted for export.



