



# Tamanu Original unrefined oil

## The sacred tree with a thousand virtues ...

Used by indigenous tribes in the Pacific area to shape dog outs or ritual objects, Ati sacred tree still plays a key role in local pharmacopoeia : its fruits, leaves and roots have exceptional curative properties.

Back in the 1950's, scientific studies\* have highlighted for the time its healing, anti-bacterial, anti-parasitic and dramatic anti-inflammatory benefits.



\* (list) :

J. CHEVRIER : "Étude sur un nouvel agent cicatrisant de plaies et muqueuses. l'Huile de Calophyllum"  
Thèse de doctorat en médecine, Paris, octobre 1951.  
LEDERER E- DIETRICH P- POLONSKY J. : "Sur la constitution chimique du Calophyllole et de l'acide calophyllique isolé des noix Calophyllum Inophyllum" - Bulletin de la Société Chimique française n°5, 1953, pp 546-549.  
RC SAKHENA-R. NATH-G. PAUL-SK NIGAM-HP BHARGAVA : "Effect of Calophyllole, a non-steroidal anti-inflammatory agent, on capillary permeability" - Journal of Medicinal Plant Research 1982, Vol 44, pp 246-248  
TN BHALLA-RC SAKHENA-SK NIGAM-G. MISRA-HP BHARGAVA : "Calophyllole, a new non-steroidal anti-inflammatory agent"  
Indian J Med Res 72, November 1980, pp 762-765.

## Manufacturing Process

Almonds extracted from nuts are being sun dried during one to two months. Meanwhile, they loose up to one third of their weight, get browner and slowly get filled with an aromatic oil.

The oil is then extracted by cold mechanical crushing, filtered and purified, before being stabilized by a natural anti-oxidant (vitamin E).



## Chemical informations

Acid value : < 100 mg/g

Saponification value : 185 - 235 mg/g

Peroxide value : < 20 meq. O<sub>2</sub>/kg

Ester value : 140 - 175 mg/g

Resins : 10 % minimum

Unsaponifiables : 0,5 - 1,0%

Antioxidant : natural tocopherols 0,2%

## Botanical informations

Botanical name : Calophyllum inophyllum

Family : guttiferæ

Part of the plant used : almond of dried fruit

Morphological type : tree

Geographic area : French Polynesia ...

Common name : tamanu, ati, kamanu, calophylle ...

## Physical informations

Aspect, 16- 20 °C : liquid + cristallization of resins

Aspect, 25°C : liquid

Odour : characteristic of the nut, spicy

Colour : Dark green

Specific gravity, 25°C : 0,91 - 0,96 kg/l

Refractive index, 20°C : 1,463 - 1,495

Solubility in water : unmiscible

Solubility in oils : miscible

Solubility in ethanol : partly miscible (resins)

## Bacteriological informations

Aerobic bacteria : <100 ufc/g.

Yeasts - Moulds : <10 ufc/g.

**PSC reference** : HTAM

**INCI name** : Calophyllum inophyllum seed oil, Tocopherol

**CTFA name** : Calophyllum inophyllum seed oil, Tocopherol

**CAS** : 241148-25-4

**EINECS** : 310-127-6

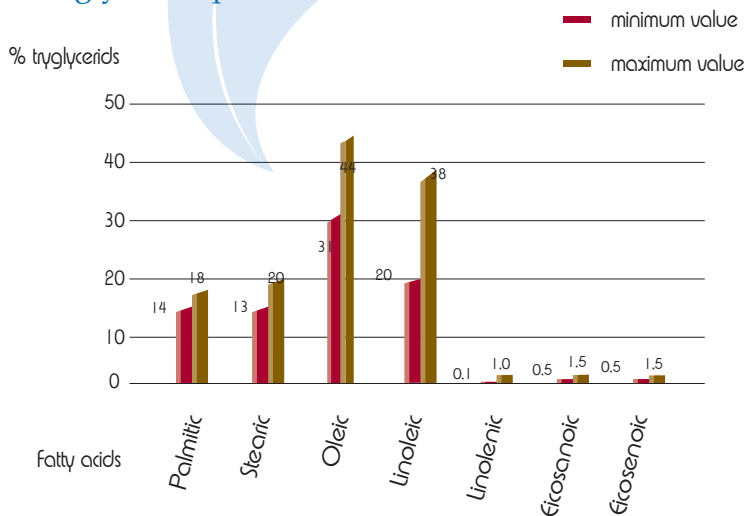
**Tariff heading** : 1515906000

# Composition

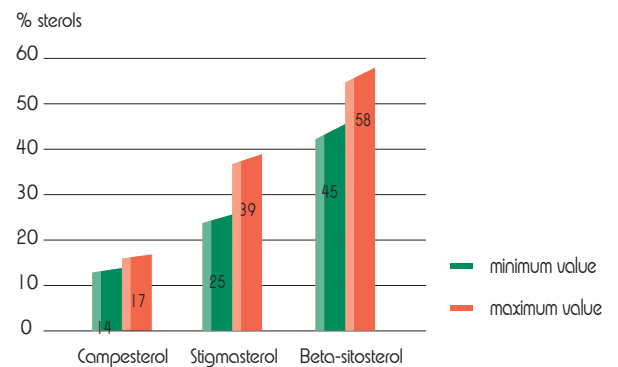


- . Fatty acids, glycerids, unsaponifiables (sterols)
- . Essential fatty acid :
  - linolenic acid (ALA) : 0,3 to 0,5 % (precursor omega 3 family)
  - linoleic acid (AL) : 24 to 38% (precursor omega 6 family)
- . Triterpens (canophyllal, canophyllol, canophyllic acid)
- . Xanthons & steroids
- . Coumarins :
  - Calophyllolids (natural neo-flavonoids with anti-bacteria . anti-inflammatory and anti blood-coagulation activities)
  - Calophyllic acid (natural neo-flavonoid with anti-molluscicidal and healing activities)
  - Inophyllolids (natural neo-flavonoids with anti-viral activity)

## Triglycerids profile



## Unsaponifiables



Resins (active compounds) : > 10%

### Coumarins

*Anticoagulant, anti-inflammatory, anti-convulsion.*

#### Phenyl-4 Coumarins

- Calophyllolid - C<sub>25</sub>H<sub>22</sub>O<sub>5</sub>
- Inophyllolid - C<sub>25</sub>H<sub>22</sub>O<sub>5</sub>
- Calophyllic acid - C<sub>25</sub>H<sub>24</sub>O<sub>6</sub>
- Tomentolid A - C<sub>25</sub>H<sub>22</sub>O<sub>5</sub>
- Desoxo-1,2 Hydroxy-1,2 Inophyllolid - C<sub>25</sub>H<sub>26</sub>O<sub>4</sub>
- Apetalolid - C<sub>36</sub>H<sub>24</sub>O<sub>5</sub>
- Calaustralin - C<sub>25</sub>H<sub>23</sub>O<sub>5</sub>
- Calafloid - C<sub>29</sub>H<sub>36</sub>O<sub>5</sub>

#### Alkyl-4 Coumarins

### Xanthons

*Anti-inflammatory*

- Calophyllin B (C<sub>18</sub>H<sub>16</sub>O<sub>4</sub>)
- Mesuaxanthon (C<sub>13</sub>H<sub>8</sub>O<sub>5</sub>)
- Jacareubin (C<sub>18</sub>H<sub>14</sub>O<sub>6</sub>).
- Desoxy-6 jacareubin (C<sub>18</sub>H<sub>14</sub>O<sub>5</sub>)
- Dimethylallyltetrahydroxy xanthon (C<sub>18</sub>H<sub>20</sub>O<sub>6</sub>)

### Triterpens

- Friedelin (C<sub>30</sub>H<sub>50</sub>O)
- Canophyllal (C<sub>30</sub>H<sub>48</sub>O<sub>2</sub>)
- Canophyllol (C<sub>30</sub>H<sub>50</sub>O<sub>2</sub>)
- Canophyllic acid (C<sub>30</sub>H<sub>50</sub>O<sub>2</sub>)

### Other active compounds

- Inophyllic acid (C<sub>17</sub>H<sub>20</sub>O<sub>3</sub>)
- Calophenic acid (C<sub>22</sub>H<sub>22</sub>O<sub>5</sub>)
- Inophenic acid (C<sub>24</sub>H<sub>34</sub>O<sub>6</sub>)
- Inophylloïdic acid (C<sub>25</sub>H<sub>24</sub>O<sub>5</sub>)



## Properties

- . Soothing and protective ( sunburns, inflammations, erythems ....)
- . Regenerating on the epidermis cells ( burns, cracks...)
- . Anti-bacterial and anti-septic
- . Anti-acneic
- . Moisturizing, nourishing and repairing
- . Increase the microcirculation - Heavy legs

## Protective activity

### Evaluation of the protective effect (stinging test / in-vivo)

The protective effect against external aggression was evaluated by induction of irritation of the nasolabial fold level with lactic acid pre- and post-tamanu oil application. The results obtained show that tamanu oil is endowed with a very good protective effect against environmental aggressions.

*EVIC-CEBA laboratory study June 2000 - lh 268/01*

### Regenerating activity (in-vitro)

The cell viability of reconstituted epidermis was evaluated following irritant challenge and application of a solution containing 3% of tamanu oil. The results show that tamanu oil induce a recovery of cell viability (vs. the control) of approximately 7%.

*Mikrona laboratory feb. 2003 - N°03/0607i*

### Anti-bacterial activity ( in-vitro)

Antibacterial activity was evaluated by determining the minimum inhibitory concentration (MIC) with respect to microorganism growth. The action of tamanu oil on bacterial proliferation and particularly that of Propionibacterium acnes shows that it is endowed with a potent inhibitory activity and thus inhibits the phenomena of irritation induced by that bacterium.

$0,125 \text{ mg/ml} < \text{C.M.I.} < 0,250 \text{ mg/ml}$

*Mikrona laboratory oct. 2002 - N°02/4500i*

### Evaluation of the efficacy of tamanu oil on heavy legs

After five days of twice daily use, the tamanu original oil tended to increase the microcirculation : + 5 % on average in 63 % of the volunteers.

Height hours after first application, 81 % of the volunteers noticed an improvement of the skin state and aspect.

69 % found their legs less heavy and 63 % found their legs less tired.

*DermScan - april 2007 - study N° 07D0458*

### Evaluation of VEGF ( Vascular endothelial Growth factor) synthesis modulation (in-vitro)

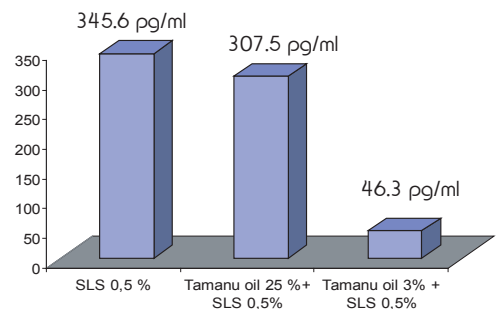
In the experimental conditions the Tamanu original oil does increase the VEGF production, in this in vitro model, compared to untreated cells, in particular after 6 h exposure ( +69%).

*ABIKH oct. 2006 - REU/551/06/FUNZ/ELB*

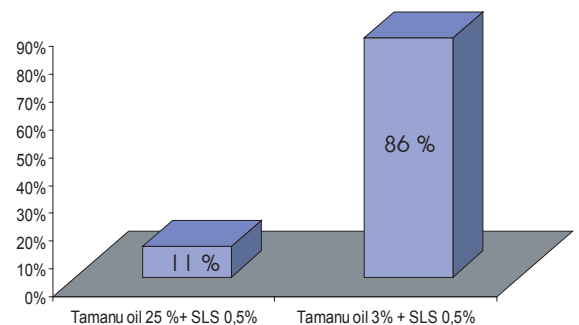


### Evaluation of the anti- inflammatory potential (in-vitro)

The tamanu oil was tested on reconstructed artificial epithelium to evaluate the IL-1 alpha production after SLS0.5 % exposure. After 16 h :



### % inhiton of IL-1 alpha release after exposure to the tamanu oil and SLS



The tamanu oil has been able to highly reduce the SLS - induced release of a pro-inflammatory cytokine ( IL-1 alpha).

the product show anti- inflammatory activity.

This data may be considered as predictive of a protective and anti-inflammatory effect on the epidermis.

*ABIKH oct. 2005 - REU/244/05/FUNZ/ELB*



## Pharmaceutical uses

- **Dolno** : Éthyllic ether of Tamanu, used against leprosy's pains
- **Resin of Tacamahaque** : register in French Pharmacopeia, contained in magistral preparations (green balms...)
- **Inocalo\*** : Purified oil of Calophyllum (galenics forms : phial, cream and ovum)

\*Pharmaceutical laboratory Pro-Medica, Paris

## Using informations

- Skin care : 5 to 20 %
- Make-up products : 2 to 5 %
- Hygien products : 0.5 to 10 % (soaps)
- Aromatherapy : use pure as an active, or associated to other oils

Tamanu unrefined oil is free of toxicity in the cosmetics limits of use advised.

It may contain some precipitate.  
Should be warmed before using

## Cosmetic uses

- Suncare and after sun products
- Protective cares, regenerating and anti-ageing products for dried, damaged or irritated skins
- Hair care and body hygien
- Aromaterapy
- Make up, lip balm
- Natural preservative



## Storage

Store in a cool dry place in unopened containers away from sunlight.

## Oral Toxicity

\*Acute oral toxicity in the mouse of the product Tamanu Oil

The single oral administration of the product in the male and female Mouse at the dose of 5 ml/kg :

- did not cause any death.
- had no toxic effect on the animals
- did not modify their weight growth.
- did not cause any visible organic effect.

Under the experimental conditions adopted, the LDO and LD50 by oral route in the mouse of the product : Tamanu oil are higher than 5 ml/kg.

EUIC CGBA august 1999-study Ref: Tr 543 / 99-2264

## Sensitizing potential ( HRIPT)

Test on 50 healthy volunteers with normal skin ( Marzulli - Maibach method) : The Tamanu Original oil can be considered non irritant and non sensitizing . It can claim the label **"HYPOALLERGENIC"**.

DermScan April 2007- study DN-730/07EO398

## Assessment of mutagenic activity ( AMES)

The Tamanu original oil does not induce reverse mutation on four Salmonella Typhimurium strains and one Escherichia coli WWP2 (uvra) strain according to the OECD guidelines N° 471 and to the methode B13/B14 of the directive 200/32/EC.

DermScan March 2007- study 2007-EH1815-1

## Packaging

Modified atmosphere packaging (nitrogen)

- 1 / 5 / 25 kg : jerry can PE-HD
- 190 kg : metal drum with a complet opening



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Update: 21/07/09