

[Planta Med.](#) 2005 Jan;71(1):90-2.

**Inhibitory effects of xanthenes from guttiferae plants on PAF-induced hypotension in mice.**

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The inhibitory effects of 22 xanthenes from three Guttiferae plants (*Hypericum patulum*, *Calophyllum inophyllum* and *C. austroindium*) on exogenous platelet activating factor (PAF)-induced hypotension were examined using a blood pressure monitoring in vivo assay method. Guanandin (2), caloxanthone E (3), 1,3,5,6-tetrahydroxy-2-isoprenylxanthone (8), 6-deoxyjacareubin (11) and patulone (18) showed strong inhibition of PAF-induced hypotension, with inhibitory effects of more than 60 %. Their ID50 values were greater than that of ginkgolide B (BN-52 021), a natural PAF-antagonist from the *Ginkgo biloba*.

PMID: 15678383 [PubMed - indexed for MEDLINE]

[Eur J Pharm Sci.](#) 2007 Mar;30(3-4):203-10. Epub 2006 Nov 9.

**Cytoprotective effect against UV-induced DNA damage and oxidative stress: role of new biological UV filter.**

[Said T](#), [Dutot M](#), [Martin C](#), [Beaudeau JL](#), [Boucher C](#), [Enee E](#), [Baudouin C](#), [Warnet JM](#), [Rat P](#).

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The majority of chemical solar filters are cytotoxic, particularly on sensitive ocular cells (corneal and conjunctival cells). Consequently, a non-cytotoxic UV filter would be interesting in dermatology, but more especially in ophthalmology. In fact, light damage to the eye can be avoided thanks to a very efficient ocular antioxidant system; indeed, the chromophores absorb light and dissipate its energy. After middle age, a decrease in the production of antioxidants and antioxidative enzymes appears with accumulation of endogenous molecules that are phototoxic. UV radiations can induce reactive oxygen species formation, leading to various ocular diseases. Because most UV filters are cytotoxic for the eye, we investigated the anti-UV properties of *Calophyllum inophyllum* oil in order to propose it as a potential vehicle, free of toxicity, with a natural UV filter action in ophthalmic formulation. *Calophyllum inophyllum* oil, even at low concentration (1/10,000, v/v), exhibited significant UV absorption properties (maximum at 300nm) and was associated with an important sun protection factor (18-22). Oil concentrations up to 1% were not cytotoxic on human conjunctival epithelial cells, and *Calophyllum inophyllum* oil appeared to act as a cytoprotective agent against oxidative stress and DNA damage (85% of

the DNA damage induced by UV radiations were inhibited with 1% Calophyllum oil) and did not induce in vivo ocular irritation (Draize test on New Zealand rabbits). Calophyllum inophyllum oil thus exhibited antioxidant and cytoprotective properties, and therefore might serve, for the first time, as a natural UV filter in ophthalmic preparations.  
PMID: 17188472 [PubMed - indexed for MEDLINE]

[Yao Xue Xue Bao.](#) 2004 Apr;39(4):305-8.

### **[Effects of fungal elicitor on inophyllums production in suspension cultured cells of Calophyllum inophyllum L.]**

[Article in Chinese]

[Luo HL](#), [Guo Y](#), [Cui TB](#), [Dai JG](#), [Zhang JS](#), [Xu BQ](#).

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AIM: To investigate the effects of fungal elicitors on inophyllums production in suspension cultured cell of Calophyllum inophyllum Linn. METHODS: The pathogen of leaf spot disease of C. inophyllum L. was isolated and prepared as fungal elicitor. The fungal elicitor was added to the medium with different concentrations and culture period. Their effects on biomass and inophyllums content of the suspension of cultured cells were studied. RESULTS: The optimum effects of S-I fungal elicitor concentrations on inophyllums content was 60 mg GE x L(-1). Adding the fungi elicitor into the cell suspension culture system at stationary phase (being cultured for 18 days) resulted in a highest inophyllum content of 59.174 mg x L(-1) at the 3rd day with 27% higher than control. Fungal elicitor treatment promoted the inophyllums accumulation in medium. CONCLUSION: Adding the Stagonospora curtisii (Berk.) Sacc. to the medium was effective approaches to enhance inophyllums yield in the suspension of C. inophyllum L culture cell.

PMID: 15303665 [PubMed - indexed for MEDLINE]

[Contact Dermatitis.](#) 2004 Oct;51(4):216-7.

### **Allergic contact dermatitis from tamanu oil (Calophyllum inophyllum, Calophyllum tacamahaca).**

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PMID: 15500678 [PubMed - indexed for MEDLINE]

[Bioorg Med Chem Lett.](#) 1998 Dec 15;8(24):3475-8.

### **Anti-HIV coumarins from Calophyllum seed oil.**

**Spino C, Dodier M, Sotheeswaran S.**

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The seeds of *Calophyllum cerasiferum* Vesque (Family-Clusiaceae), and *Calophyllum inophyllum* Linn. (Family-Clusiaceae) contain several known coumarins, among which were the potent HIV reverse transcriptase inhibitors costatolide and inophyllum P. *Calophyllum cerasiferum* contained (-)-calanolide B as its major coumarin constituent in significant amount and thus constitute a renewable source of this compound.

PMID: 9934455 [PubMed - indexed for MEDLINE]

[Med Res Rev.](#) 2000 Sep;20(5):323-49.

**Current lead natural products for the chemotherapy of human immunodeficiency virus (HIV) infection.**

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A large variety of natural products have been described as anti-HIV agents, and for a portion thereof the target of interaction has been identified. Cyanovirin-N, a 11-kDa protein from Cyanobacterium (blue-green alga) irreversibly inactivates HIV and also aborts cell-to-cell fusion and transmission of HIV, due to its high-affinity interaction with gp120. Various sulfated polysaccharides extracted from seaweeds (i.e., *Nothogenia fastigiata*, *Aghardhiella tenera*) inhibit the virus adsorption process. Ingenol derivatives may inhibit virus adsorption at least in part through down-regulation of CD4 molecules on the host cells. Inhibition of virus adsorption by flavanoids such as (-)-epicatechin and its 3-O-gallate has been attributed to an irreversible interaction with gp120 (although these compounds are also known as reverse transcriptase inhibitors). For the triterpene glycyrrhizin (extracted from the licorice root *Glycyrrhiza radix*) the mode of anti-HIV action may at least in part be attributed to interference with virus-cell binding. The mannose-specific plant lectins from *Galanthus*, *Hippeastrum*, *Narcissus*, *Epipactis helleborine*, and *Listera ovata*, and the N-acetylglucosamine-specific lectin from *Urtica dioica* would primarily be targeted at the virus-cell fusion process. Various other natural products seem to qualify as HIV-cell fusion inhibitors: the siamycins [siamycin I (BMY-29304), siamycin II (RP 71955, BMY 29303), and NP-06 (FR901724)] which are tricyclic 21-amino-acid peptides isolated from *Streptomyces* spp that differ from one another only at position 4 or 17 (valine or isoleucine in each case); the betulinic acid derivative RPR 103611, and the peptides tachyplesin and polyphemusin which are highly abundant in hemocyte debris of the horseshoe crabs *Tachyplesus tridentatus* and *Limulus polyphemus*, i.e., the 18-amino-acid peptide T22 from which T134 has been derived. Both T22 and T134 have been shown to block T-tropic X4 HIV-1 strains

through a specific antagonism with the HIV corecept or CXCR4. A number of natural products have been reported to interact with the reverse transcriptase, i.e., baicalin, avarol, avarone, psychotrine, phloroglucinol derivatives, and, in particular, calanolides (from the tropical rainforest tree, *Calophyllum lanigerum*) and inophyllums (from the Malaysian tree, *Calophyllum inophyllum*). The natural marine substance illimaquinone would be targeted at the RNase H function of the reverse transcriptase. Curcumin (diferuloylmethane, from turmeric, the roots/rhizomes of *Curcuma* spp), dicaffeoylquinic and dicaffeoyl tartaric acids, L-chicoric acid, and a number of fungal metabolites (equisetin, phomasetin, oteromycin, and integric acid) have all been proposed as HIV-1 integrase inhibitors. Yet, we have recently shown that L-chicoric acid owes its anti-HIV activity to a specific interaction with the viral envelope gp120 rather than integrase. A number of compounds would be able to inhibit HIV-1 gene expression at the transcription level: the flavonoid chrysin (through inhibition of casein kinase II, the antibacterial peptides melittin (from bee venom) and cecropin, and EM2487, a novel substance produced by *Streptomyces*. (ABSTRACT TRUNCATED)

PMID: 10934347 [PubMed - indexed for MEDLINE]

[J Am Pharm Assoc Am Pharm Assoc \(Baltim\)](#). 1954 Sep;43(9):543-6.

### **The in vitro evaluation of the antibacterial activity of undi oil (*Calophyllum inophyllum* Linn.).**

**[BHAT SG](#), [KANE JG](#), [SREENIVASAN A](#).**

PMID: 13201477 [PubMed - indexed for MEDLINE]

[Cancer Lett](#). 2001 Aug 10;169(1):15-9.

### **Cancer chemopreventive agents, 4-phenylcoumarins from *Calophyllum inophyllum*.**

**[Itoigawa M](#), [Ito C](#), [Tan HT](#), [Kuchide M](#), [Tokuda H](#), [Nishino H](#), [Furukawa H](#).**

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In a search for anti-tumor-promoting agents, we carried out a primary screening of ten 4-phenylcoumarins isolated from *Calophyllum inophyllum* L. (Guttiferae), by examining their possible inhibitory effects on Epstein-Barr virus early antigen (EBV-EA) activation induced by 12-O-tetradecanoylphorbol-13-acetate in Raji cells. All of the compounds tested in this study showed inhibitory activity against EBV, without showing any cytotoxicity. Calocoumarin-A (5) showed more potent activity than any of the other compounds tested. Furthermore, calocoumarin-A (5) exhibited a marked inhibitory effect on mouse skin tumor promotion in an in vivo two-stage carcinogenesis test. The

results of the present investigation indicate that some of these 4-phenylcoumarins might be valuable as potential cancer chemopreventive agents (anti-tumor-promoters).

PMID: 11410320 [PubMed - indexed for MEDLINE]

[J Biotechnol.](#) 2007 Jul 15;130(4):346-53. Epub 2007 May 6.

### **Pattern of anti-HIV dipyrano coumarin expression in callus cultures of *Calophyllum inophyllum* Linn.**

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Callus cultures of *Calophyllum inophyllum* were established using seed, nodal/ internodal and leaf explants on WPM basal medium supplemented with indole-3-butyric acid (IBA), alpha-naphthalene acetic acid (NAA), picloram (4-amino-3,5,6-trichloropicolinic acid), and 6-benzylaminopurine (BAP) in different combinations and concentrations with the view to study the influence of hormones on callus induction and the pattern of expression of dipyrano coumarins including anti-HIV, non-nucleoside reverse transcriptase inhibitors inophyllum B and P in callus cultures. 96.01% seed explants, 87.50% nodal/internodal explants and 86.66% leaf explants were converted into calluses when inoculated on WPM supplemented with IBA 4.0 mg l(-1) along with BAP 1.0 mg l(-1), IBA 4.0 mg l(-1), and picloram 6.0 mg l(-1) along with BAP 2.0 mg l(-1), respectively. Calluses induced from seed explants were white, friable and irregular whereas nodal/ internodal and leaf explants induced dark brown, nodular and compact calluses. In order to facilitate the rapid quantitative analysis of dipyrano coumarins under study, a novel HPLC method capable of separating all six dipyrano coumarins in a single isocratic run has been optimized. Quantitative HPLC analysis of callus extracts revealed that highest inophyllum B (40.59 mg 100g callus(-1)) was expressed in callus induced from seed explant on medium containing 2.0 mg l(-1) indole-3-butyric acid, while highest inophyllum P (141.35 mg 100g callus(-1)) was estimated in seed callus induced on medium containing 2.0 mg l(-1) indole-3-butyric acid along with BAP 1.0 mg l(-1).

PMID: 17601621 [PubMed - in process]

[Indian J Exp Biol.](#) 2004 Jan;42(1):91-5.

### **Bioactivity of non-edible oil seed extracts and purified extracts against *Helicoverpa armigera* (Hubner).**

**[Pawar P](#), [Joseph M](#), [Tungikar V](#), [Joshi S](#).**

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Extracts and purified extracts of seeds of two plant species, *Madhuca latifolia* and *Calophyllum inophyllum* when evaluated against the 2nd instar larvae of *Helicoverpa armigera* reared on synthetic diet, exhibited high larval mortality, prolongation of developmental period, morphological deformities and highly significant reduction in adult emergence. The reduction in larval weights in the treatments was also highly significant.

PMID: 15274488 [PubMed - indexed for MEDLINE]

[Indian J Exp Biol.](#) 1970 Jan;8(1):39-40.

### **Antibacterial principle of the root bark of *Calophyllum inophyllum*: isolation and antibacterial activity.**

[Potti GR, Kurup PA.](#)

PMID: 5423333 [PubMed - indexed for MEDLINE]

[Phytochemistry.](#) 2004 Oct;65(20):2789-95.

### **Antimicrobial and cytotoxic agents from *Calophyllum inophyllum*.**

[Yimdjo MC, Azebaze AG, Nkengfack AE, Meyer AM, Bodo B, Fomum ZT.](#)

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The study of the chemical constituents of the root bark and the nut of *Calophyllum inophyllum* has resulted in the isolation and characterization of a xanthone derivative, named inoxanthone, 3, together with 12 known compounds: caloxanthones A, 4 and B, 5, macluraxanthone, 6, 1,5-dihydroxyxanthone, 7, calophynic acid, 8, brasiliensic acid, 9 inophylloic acid, 10, friedelan-3-one, 11, calaustralin, 12, calophyllolide, 13, inophyllums C, 14 and E, 15. Their structures were established on the basis of spectral evidence. Their in vitro cytotoxicity against the KB cell line and their antibacterial activity and potency against a wide range of micro organisms were evaluated.

PMID: 15474565 [PubMed - indexed for MEDLINE]

[Magn Reson Chem.](#) 2005 Jan;43(1):65-8.

### **Structures of new secofriedelane and friedelane acids from *Calophyllum inophyllum* of French Polynesia.**

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Three new friedelane-type triterpenoids, 3,4-secofriedelan-3,28-dioic acid (1), 27-hydroxyacetate canophyllic acid (2) and 3-oxo-27-hydroxyacetate friedelan-28-oic acid (3), were isolated from the leaves of *Calophyllum inophyllum* (Clusiaceae) grown in French Polynesia.

Their structures were established by the concerted application of 2D NMR techniques including gs-COSY, gs-HMQC and gs-HMBC. Copyright 2004 John Wiley & Sons, Ltd.

PMID: 15468303 [PubMed - indexed for MEDLINE]

[Planta Med.](#) 1992 Feb;58(1):51-5.

### **Molluscicidal constituents of *Calophyllum* from Madagascar: activity of some natural and synthetic neoflavonoids and khellactones.**

[Ravelonjato B](#), [Libot E](#), [Ramiandrasoa F](#), [Kunesch N](#), [Gayral P](#), [Poisson J](#).

Laboratoire de Chimie des Substances Thérapeutiques Naturelles, Faculté de Pharmacie, Cedex, France.

Crude extracts of seeds, leaves and barks of four Madagascan *Calophyllum* species: *C. inophyllum*, *C. recedens*, *C. chapelieri*, and *C. verticillatum*, have been tested for molluscicidal activity against *Biomphalaria glabrata*. All seed extracts showed significant activity. The major constituents of the most active *Calophyllum* species were examined. Some related coumarinic derivatives were synthesized in order to improve the biological activity. Among the compounds prepared, 5,7-dihydroxy-6-(2-methylbutyryl)-4-phenyl-coumarin presented an interesting molluscicidal activity.

PMID: 1620744 [PubMed - indexed for MEDLINE]

[Phytochemistry.](#) 2005 Aug;66(15):1825-31.

### **Composition of fatty acids triacylglycerols and unsaponifiable matter in *Calophyllum calaba* L. oil from Guadeloupe.**

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The composition of the kernel oils of two *Calophyllum* species (*Calophyllum calaba* L. and *Calophyllum inophyllum* L.) was investigated. The physico-chemical properties and fatty acid composition of the kernel oils were examined. In two species, oleic acid C18:1 (39.1-50%) is the dominating fatty acid followed by linoleic acid C18:2 (21.7-31.1%) as the second major fatty acid. Stearic C18:0 (13.4-14.3%) and palmitic C16:0 (11-13.7%) acids are the major saturates. The oils contains an appreciable amount of unsaturated fatty acids (70.8-73.10%). Most of the fatty acids are present as triacylglycerol (76.7-84%), twenty one triacylglycerols are detected with predominantly unsaturated triacylglycerols. The total unsaponifiable content, its general composition and the identity of the components of the sterol and tocopherol fractions are presented. In

both species, analysis of the unsaponifiable fractions revealed the preponderance of phytosterols, mainly stigmasterol (35.8-45.1%) and beta-sitosterol (41.1-43.1%). Among the eight tocopherols and tocotrienols present in two species, variations exist; alpha-tocopherol (183 mg/kg) is the main tocopherol in *Calophyllum calaba* L. and Delta-tocotrienol (236 mg/kg) is the dominant tocotrienol in *Calophyllum inophyllum* L.

PMID: 16045947 [PubMed - indexed for MEDLINE]

[Nat Prod Res.](#) 2006 May 10;20(5):485-91.

### **Inophyllin A, a new pyranoxanthone from *Calophyllum inophyllum* (Guttiferae).**

**[Ee GC](#), [Kua AS](#), [Lim CK](#), [Jong V](#), [Lee HL](#).**

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In the authors' continuing search for new natural products, their recent studies on the roots of *Calophyllum inophyllum* (Guttiferae) have yielded a new prenylated pyranoxanthone, Inophyllin A together with the common triterpenes friedelin and stigmasterol. Structural elucidations of these compounds were achieved through <sup>1</sup>H, <sup>13</sup>C, DEPT, COSY, HSQC and HMBC experiments. The molecular mass was determined using MS techniques. The authors report here the isolation of and structural elucidation for Inophyllin A as well as its toxicity test result. The discovery of this new natural product from the unexploited Malaysian forest will certainly contribute to the search for potential natural larvicides.

PMID: 16644547 [PubMed - indexed for MEDLINE]

[Zhongguo Zhong Yao Za Zhi.](#) 2007 Apr;32(8):692-4.

### **[Studies on flavonoids from stems and leaves of *Calophyllum inophyllum*]**

[Article in Chinese]

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OBJECTIVE: To study the chemical constituents from the stems and leaves of *Calophyllum inophyllum*. METHOD: The compounds were isolated by column chromatography on silica gel, Sephadex LH-20 and preparative TLC. Their structures were elucidated by chemical methods and NMR, MS spectroscopic data. RESULT: Nine compounds were identified as 2-hydroxyxanthone (1), 4-hydroxyxanthone (2), 1, 5-dihydroxyxanthone (3), 1, 7-dihydroxyxanthone (4), 1, 3, 5-trihydroxy-2-methoxyxanthone (5), 6-deoxyjacareubin (6), amentoflavone (7), kaempferol-3-O-alpha-L-rhamnoside (8) and

quercetin-3-O-alpha-L-rhamnoside (9). CONCLUSION: Compounds 8 and 9 were isolated from the genus *Calophyllum* and compounds 1, 2, 4-6 were isolated from this plant for the first time.  
PMID: 17608221 [PubMed - in process]