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# Utilization of Jernang Resin (*Daemonorops draco*) as the Basic Material for Making Liquid Wound Medicine

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**Abstract.** Jernang is obtained from rattan sap which contains resin in the world known as dragon's blood with the Latin name *daemonorops draco* BL, the resin produced is red, jernang is antibacterial, the secondary metabolic content of flavonoids and triterpenoids, resin obtained by maceration using ethanol organic solvents technical. Methods: making liquid wound medicine using base resin, ethanol and propylene glycol with 10% clear formulation, 50% ethanol and 50% propylene glycol. The results obtained by liquid wound medicine with pH 6, clear solubility dissolved in organic solvents ethanol and propylene glycol, viscosity is not measurable. There was no irritation and the wound healed completely without any scars on the skin

## 1. Introduction

Jernang is one type of forest product obtained from a kind of rattan from the clan *daemonorops* [1]. The genera *daemonorops* has around 115 species [2]. Rattan *daemonorops* can produce red resin called jernang [3] in the world of commerce often referred to as the dragon's blood. Clear fruit resin is obtained from female jernang fruit [6] or from jernang hermaphrodite. Dragon's blood is obtained from *Daemonorops draco* Blume, *Daemonorops didymophylla* Becc, *Daemonorops brathystachys* Furtado, *Daemonorops draconcellus* Becc, *Daemonorops mattanensis* Becc, *Daemonorops propinqua* Becc, and *Daemonorops micracantha* (Griff) Matt [7]. This resin is used as an ingredient in making medicines, efficacious gum can stop bleeding (static blood dispel, reduce pain (relieve pain), injury trauma due to fractures (traumatic injuries causing fracture) bruising medication, sprains stop bleeding due to bruising and stop bleeding protects the festering wounds surface to rot, growing the fleshtissue, and relieving the pain in chronic wounds (chronic non-healing sores). Oral use, the sap was used as incense. Clear sap was believed to be booster in a magical ritual. The burning of jernang sap on incense caused in the magical level of the spells recited. Entrusted as a passion enhancer, as an anti-toxin witch can neutralize rac toxicity in certain.

The chemical compounds of jernang sap include: 5,7-dihydroxy-6-methylflavan, 7-hydroxy-5-methoxyflavan, Dracoflavan A, 5,5', 7,7'-tetrahydroxy-4,8'-biflavan, Dracoflavan B1, Dracoflavan B2, Dracoflavan C, Dracoflavan CI, Dracoflavan C2, Dracoflavan D1, Dracoflavan D2, Dracoxepine, Dracorubin (used as an antiseptic), Nordracorubin, 12-Ursene-3,38-diol (which are used as antineoplastic agents) have variants such as Epiuvaol and Uvaol [8, 9].

Jernang sap is quite popular in tribal children in the community because its traditional properties are quite a lot, among others, used as medicine for wounds, efficacious can stop bleeding (static blood dispel, reduce pain (relieve pain), injury trauma due to fractures (traumatic injuries causing fracture) bruising medication, sprains stop the bleeding due to bruising and stops bleeding to protect the festering

wound surface from decaying, grow flesh tissue, and relieve pain in chronic wounds (chronic non-healing sores )

The development of the traditional medicine industry is increasing along with the increasing need of the community for safe medicine for liquid wounds but is efficacious to overcome various health complaints after experiencing skin wounds. In general, traditional medicinal raw materials in Indonesia come from plant symphilisia or plants.

Based on empirical data as well as library research, the preparation of dracodin liquid wounds from traditional medicinal plants "Jernang sap (*Daemonorops draco* BL) as a liquid wound medicine is made. The goal is to obtain liquid wounds from traditional jernang gum (*daemonorops draco* BL) as a liquid wound medicine.

A type of rattan taken from the clear fruit *daemonorops darco* BL for sap extract is known as jernang resin. The fruit is round and small gathered like zalacca. Jernang is a vine in the surrounding trees. In jernang sap contains dracoresen compounds (11%), draco resinolanol (56%), draco alban (2.5%), and the rest benzoate acid and bensolactic acid. Jernang sap is usually used as a mixture of diarrhea, dysentery and blood clots due to wounds, as raw material for porcelain coloring, marble coloring, leather tanning materials, lipstick raw materials and others. From the results of a literature search that this jernang resin has not been carried out for the manufacture of liquid wound medicine, only this resin is used by the tribe children in its powder to treat wounds, to release after finishing and the medicine for stomach pain (diarrhea). The phytochemical test results of secondary metabolic testing (Alkolid, Flavonoids, saponins, terpenoids) of resin (resin) from the plant *daemonorops draco* BL, are the first steps in the preliminary test to determine the compound content. Phytochemical tests have been carried out on clear resin / resin samples with positive results containing flavonoids, positively containing terpenoids, alkoloid, saponin, and steroid negative results [10]. The results of the isolation of the EtOAc fraction obtained compound A and compound B, and based on the results of UV and IR spectrum analysis this compound was estimated as a flavonoid derivative compound and azo compound ( $N = N$ ). Associated because the phytochemical test results contained a group of metabolic compounds secondary to flavonoids, terpenoids, and antibacterial activity tests giving clear zones (+) to *E. coli*, *Salmonella* and *S. Aureus* bacteria. from the results of previous studies carried out the making of liquid wound medicine from resin with its resin formulation.

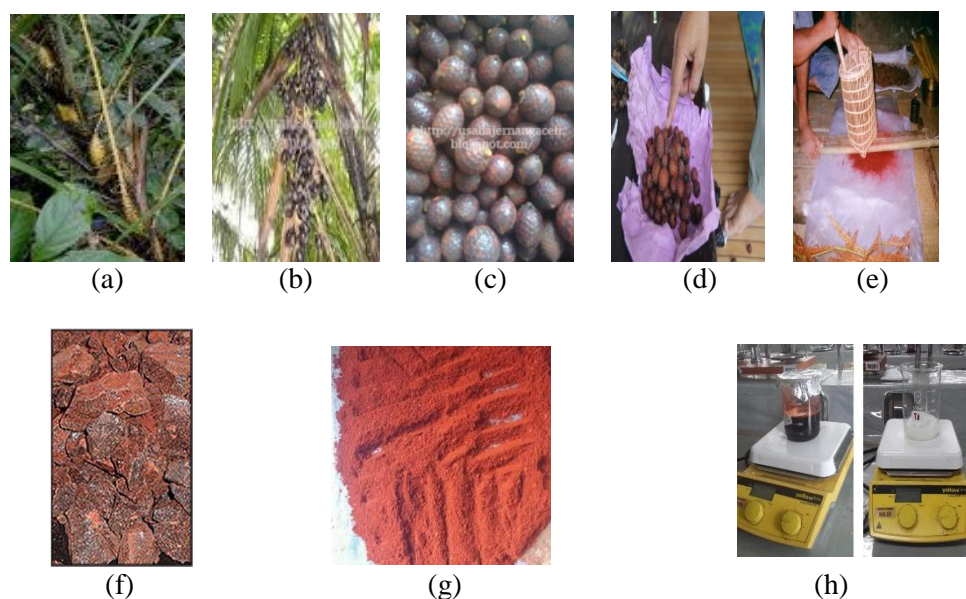
At present, the development of plants that have medicinal properties is done to cure various diseases. pengembanagna ingredients that have medicinal properties are not only from natural ingredients, but also from synthetic materials that resemble the original material (natural) informing that there are around 20,000 plant species containing medicinal ingredients traditionally used in Jambi, one of which is jernang (Dragon's blood) wound. Jernang is a red resin produced by the secretions of fruit from the kind of rattan *Daemonorops* (Arecaceae). Jernang belongs to a group of hard resins in the form of solid, glossy, or dull, brittle, and melting when heated and flammable by emitting smoke and a distinctive odor. Jernang is red, amorphous, specific gravity (BJ) between 1.18-1.20, low acid number around 100, ester number around 140, melting point approximately 120 C, soluble in alcohol, ether, fat oil, and oil volatile, partly soluble in chloroform, ethyl acetate, petroleum spirits and carbon disulfide and insoluble in water [11, 12]. Jernang is widely found in Jambi and has been used traditionally by the inner child tribe. Traditional uses of jernang include the treatment of dysentery and wound medicine (2,6,11]. The efficacy of jernang as a wound medicine is possible because jernang ethyl acetate extract has in vitro prokoagulation properties against rabbits [3]. Extracting an ingredient as a wound healing drug will be more effective when the material also has antimicrobial (antifungal and antibacterial) properties, so that the application of antimicrobial additives is no longer needed [13, 14].

## **2. Materials and Methods**

The research sample was taken from the forest in Tebo Regency, from the tribal community of the inner child, which is 10 kg of fruit that has not been processed by tribal children. Clear plants. Clear sap is macerated using ethanol solvent for 3X 24 hours, filtered. Research Materials The materials used in this study were: Jernang fruit sap (*daemonorops . draco* BL.), ethanol Technical, propylen, glycol.

The tools used are: glassware, spatulas, ball pipette ovens, refrigerators, analytic balance, pliers, distillation devices, extraction devices, separating funnels, buchner funnels, rotary evaporators and evaporation flasks (50 mL, 100 mL, 250 mL and 500 mL), wound medicine containers, speritus lamps Methods.

Sampling: Jernang fruit sap samples (*Daemonorops .draco* BL) collected in March 2017 from Suku anak dalam, Tebo Regency forest



**Figure 1.** Traditional process of extracting sap from resin (a) Plants jernang; (b) Fruit still in the stem; (c) Fruit; (d) Fruit ready to be processed; (e) Clear fruit inserted in bamboo; (f) Clear sap; (g) jernang resin powder; (h) Liquid resin jernang

The way to get clear resin from rattan fruit is done by extraction which includes dry extraction and wet extraction.

- Dry extract (crushed) is generally used by the community to get jernang. Jernang rattan fruit after harvesting is released from its mark and then put in a rattan basket (jointed), then pounded with plastic. The crushed rattan fruit will come out from the resin through the rattan basket.
- Maserasi: using ethanol to get jernang resin. Clear rattan fruit is put into a brown bottle container for 3 X 24 hours with 10 l ethanol solvent, then filtered treated until the solvent from the results of clear maceration, then the maceration results in the evaporator until the thick ethanol is extracted. Thick ethanol extract was obtained.

**Table 1.** Formulation of medicinal wounds with active ingredients

Material	FLJ1	FLJ2	FLJ3	FLJ4
Jernang (%) solid content	5	5	10	10
Etanol 96% (%) v/v	60	50	60	50
Propylen glycol (%) v/v	40	50	40	50

The formulation of liquid wound medicine made from active daemonorops jernang resin draco Blume according to the claim 1 of this liquid wound drug consists of 100% resin, 96% ethanol and glycol propilin (6: 4). And 5: 5 After being mixed homogeneously in dracodin liquid wound medicine which has been a wound medicinal product.

The method of making liquid wound remedies made from jernang resin from the daemonorops draco Blume plant in the manufacture of liquid jernang active wound medicine from daemonorops draco Blume, jernang resin which is not soluble in water can only dissolve in 96% alcohol and glycol propilin

(6:4) mixed until homogeneous and formed liquid wound medicinal products that are ready to be used by the people who need them. this method can increase the work of the wound medicine in effectiveness and efficiency in the use of liquid wounds medicine jernang then pounded and stirred. Clear resin will detach from the rattan fruit and settle. The deposits are separated and then filtered using cloth.

- Wet extraction method using organic solvents (methanol, hexana, etc.). This method is carried out by inserting jernang rattan fruit into a container containing organic solvents until the resin attached to the rattan fruit is clean. Then the solution is evaporated with soclet or distillation so that the remaining jernang in the container.
- Jernang is packaged in the form of lumps in various forms which are packaged in a plastic bag, strong and tightly closed, then put into a burlap and tightly stitched or cardboard. Each package has a maximum weight.



**Figure 2.** liquid wound medication from jernang ethanol extract

### 3. Results and Discussion

The results of secondary metabolic testing (Alkoloid, Flavonoids, saponins, terpenoids) of resin from resin plants of *daemonorops draco* BL were first, phytochemical tests were the first step in the preliminary test to determine the compound content. Phytochemical tests have been carried out on the sap/resin sap samples with positive results containing flavonoids, positively containing terpenoids, not containing alkaloid, saponin, steroid negative results [8].

Antibacterial activity test using two species of bacteria namely *Basillus subtilis* and *Staphylococcus aureus*. *B. subtilis* is a bacterium that is quite beneficial for humans, among others, can produce biosurfactant lipopeptide. Benefits of lipopeptide as bioremediation of pollutants, cosmetics, antiadhesive, etc. [16].

*S. aureus* is a bacterium that is very invasive to humans. Before the antibiotic was found (pinicillin), it was reported that this bacterial attack caused fatality in humans [15]. Furthermore Montville and Matthews (2008) report that *S. aureus* can cause inflammation of the skin, throat infections, and others [11].

Jernang resin has effectiveness as an antibacterial, the researcher made a liquid wound drug using a solvent to dissolve jernang resin namely organic solvent, technical ethanol and propylene glycol with a ratio of 4: 6 and 10% resin. Direct testing of humans who have an accident.

How to apply it by applying it to the injured skin, first giving the wound medicine the patient feels pain in the administration of the wound medicine. After one week the wound began to improve and felt no pain in the injured skin.

Based on the results of antimicrobial (antifungal and antibacterial) tests [5], jangang is also antimicrobial, so that the potential is a wound healer.

Visual observations around the openings in humans are not found with swelling, irritation and so on (figure 3). Overall, human skin that has an accident after recovery appears to have no changes before, during and after administration of jernang extract on wound healing testing. the skin that has been damaged does not leave a mark, the skin returns to normal after recovering with treatment with a liquid wound medicine from jernang resin.



**Figure 3.** (a) damaged facial skin image; (b) is currently administering liquid wound medicine



**Figure 4.** Facial skin after being treated with jernang resin liquid wounds

From figure 3 (a) and (b), a student named Razman Yuzhar Chemistry, Faculty of Science and Technology, University of Jambi, had an accident resulting in minor facial skin skin changes, when treated with jernang resin wounds, this rash felt very painful after being treated or treated medicine for liquid wounds does not feel sick anymore, the healing process in drying wounds on facial skin 8 days is dry does not experience swelling and irritation in the skin of this student. The skin of the face back in the past did not leave the slightest scar on the skin. Total recovery after 30 days of applying liquid wounds from jernang resin (figure 4).

**Table 2.** Results of physical evaluation Medication for wounds with active ingredients jernang

Observation	FLJ1	FLJ2	FLJ3	FLJ4
Day 0				
pH	6	6	6	6
Solubilit	Late	late	Late	Late
Viscosity	Not measurable	Not measurable	Not measurable	Not measurable
Day -7				
pH	6	6	6	6
Solubility	Late	Late	Late	Late
Viscosity	Not measurable	Not measurable	Not measurable	Not measurable
Day ke-14				
pH	6	6	6	6
Solubilit	Late	Late	Late	Late
Viscosity	Not measurable	Not measurable	Not measurable	Not measurable
day -21				
pH	6	6	6	6
Solubilit	Late	Late	Late	Late
Viscosity	Not measurable	Not measurable	Not measurable	Not measurable
Day -28				

Observation	FLJ1	FLJ2	FLJ3	FLJ4
pH	6	6	6	6
Solubilit	Late	Late	Late	Late
Viscosity	Not measurable	Not measurable	Not measurable	Not measurable

From table 2 data that the pH of the liquid wound drug from the extract of jernang acid resin with pH 6, using soluble ethanol and propylene glycol resin from clear liquid FLJ1, FLJ2, FLJ3, and FLJ4, all resins dissolved in a mixture of ethanol and glycol solvents, only viscosity is not measurable, treated to humans (Razman Chemistry students who experience accidents) on FLJ4 (10% resin and 50% ethanol and 50% propylene glycol). Obtained results of treatment for damaged skin recover without any trace of 30 days without cessation of administration the jernang resin liquid wound.

Jernang is widely found in Jambi and has been used traditionally by the inner child tribe. Traditional uses of jernang include the treatment of dysentery and wound medicine [2, 8, 12]. The efficacy of jernang as a wound medicine is possible because jernang ethyl acetate extract has in vitro prokoagulation properties against rabbits [4]. Extracting an ingredient as a wound healing drug will be more effective when the material also has antimicrobial (antifungal and antibacterial) properties, so that the application of antimicrobial additives is no longer needed [12, 13].

Clear sap contains flavonoid and terpenoid compounds which show many useful bioactivity, such as anti-inflammation, antimicrotic, cytotoxic and antibacterial. Flavonoid compounds can inhibit bacterial growth, because the flavonoid derivatives interact with bacterial cells through an absorption process involving hydrogen bonds. At low levels it will form complex flavonoid protein bonds with weak bonds and immediately decompose, and then neutralize flavonoids into cells and cause protein precipitation and denaturation. At high levels of flavonoids, protein coagulation and cell membranes undergo lysis. Like other antibacterial compounds, the mechanism of action of flavonoids is to inhibit bacterial growth and metabolism by damaging the cytoplasmic membrane and causing denaturation of cell proteins. So that the compound can be bactericidal or bacteriostatic, depending on the dose used.

Visual observations around the openings on damaged skin are not found with swelling, irritation and so on (figure 3 (a-b) and figure 4 ). All of the skin on Nizwan's face seemed to have no changes before, during and after administration of jernang extract on wound healing testing.

#### 4. Conclusions

From the results of the feasibility trials of jernang resin wounds medicine is very effective in the treatment of injured skin by not leaving scars on the skin, and no freezing of the skin, skin irritation as usual. With a formulation from Jernang resin as a liquid wound medicine with a clear concentration of 10% 50% ethanol and 50% propylene glycol, there is no staining on the skin.

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