

# 2013 臺灣國際科學展覽會 優勝作品專輯(國外作品)

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# **ABSTRACT OF EXHIBIT**

## **TAIWAN INTERNATIONAL SCIENCE FAIR**

### **1. Introduction**

Gangrene is the death of tissue of certain parts of the body. In Indonesia, people who suffer from Diabetes will also often suffer from Gangrene, which usually affects a patient's feet. The medication for it is not affordable for everybody. I have chosen the Horseshoe Crab, simply because it's known widely in Indonesian and can be found easily. Also, due to the fact that, among all crustaceans, the Horseshoe Crab contains the highest levels of Chitin. By using the Chitin found in the shell of the Horseshoe Crab, I shall endeavor to heal the Gangrene of Diabetic Patients.

### **2. Methodology**

After obtaining the shell, the shell was soaked in Sodium Hydroxide for 2 days for demineralization process. Then soaked in HCl for 1 day for deproteinization process. After 1 day, it is then dry under the room temperature. It took 5 days for the shell to fully dry under the room temperature. Then the shell are boiled with Sodium Hydroxide for 4 hours for deacetylation process. Which after this process, the shell are now chitosan. It is then crushed to powder using blender and was measured and add with acetic acid with the ratio of 1:100 (1g chitosan with 100 ml of acetic acid). We can now obtain the gel.

### **3. Treatment**

#### **3.1. Procedure**

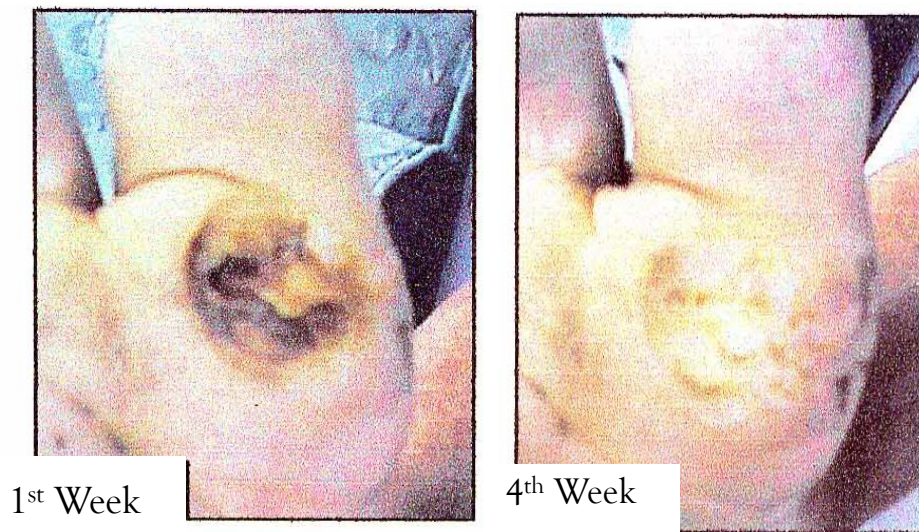
Before applying the gel, the gangrene of the patient must be cleaned with either NaCl or Alcohol. Then it is covered with gauze which has been poured enough gel to cover the gangrene. (in this case 2 tsp). The gel was changed twice a day.

#### **3.2. Result**

The gel then was applied on the gangrene of diabetic patient with this Biodata:

- (1) Name : Inem (initialized)
- (2) Age : 70 yrs old.
- (3) Time duration of gangrene : 3.5 yrs.

- (4) Blood Sugar Contents : 396 mg/dl



Pic 3.2. Before & After Treatment

#### 4. Conclusion & Suggestion

The shell of the Horseshoe Crab's Shell which is considered as waste in Indonesia can be use to make Chitosan Gel which has successfully heal the gangrene of Inem.

Further Research is needed on the combination of chitosan with other materials for patients with diabetic gangrene.

#### 5. References

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## 評語

1. The author found that chitosan from horseshoe crab has much higher viscosity compared to those from shrimp crab and squid.
2. Horse-shoe crab chitosan was used to treat diabetes foot ulcer and excellent results were obtained.
3. However, the “trials” were rather unofficial so they should be much better refined. This project should be expanded and promoted to the society.