

Full Length Research Paper

# Evaluation of Wound healing activity of *Nigella sativa* seed powder on Wistar albino rats

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Wound healing is a process which requires special treatment and care. In the modern allopathic medical system wound healing, both surgical as well as non-surgical, is a difficult task. Due to the emergence of multi-resistant organisms, wound care professionals have revisited the ancient healing methods by using traditional and alternative medicine in wound management. Several herbs are used to promote the wound healing have not yet been scientifically studied. *Nigella sativa* (black-caraway, also known as nigella or *kalonji*), often called black cumin, is an annual flowering plant in the family Ranunculaceae. The aim of this study is to identify the effectiveness of *Nigella sativa* seed powder in wound healing activity on animal model. It is an experimental study on healthy wistar albino rats. The animals were divided into 3 groups of 3 each. The animals of group A were left untreated and considered as control. Group B served as standard and received Amoxicillin. Group C was considered as test and treated with prepared test drug. Powder of test drug and standard drug were topically applied 500mg every alternative day and bandaged starting from the day of operation, till complete epithelialization up to 14 days. The direct observation of wound size, Exudates type and amount, edges, necrotic tissue type and skin colouration of surrounding wound were records converted into Bates-Jensen Wound assessment Tool. Control group showed continuing recovery due to physiological healing during the experiment up to 14 days. The Test and Standard groups showed considerably minimum duration for complete wound healing. The time duration for complete wound healing of the standard drug was observed 10 days where as Test drug, it was only 8 days. It shows that Test drug has faster recovery than Standard drug. So it is clearly denotes the *Nigella sativa* seed powder is effective on wound healing.

**Key words:** *Nigella sativa*, Wound.

## INTRODUCTION

Traditional systems of medicine have been in vogue for treating various ailments in many countries such as China, Japan and India since immemorial time. Siddha system of medicine (SSM) is one such ancient traditional system of India and practiced mostly in its southern part for treating various diseases including even chronic conditions (Arjun Ram, 2009).The study is an experimental study on evaluation of the wound healing activity of *Nigella sativa* seed powder in wistar albino rats. *Nigella sativa*, often called black cumin, is an annual

flowering plant in the family Ranunculaceae, native to south and southwest Asia. Macroscopically, seeds are small dicotyledonous, trigonus, angular, rugulose-tubercular, 2-3.5mm×12 mm, black externally and white inside, odor slightly aromatic and taste bitter (Mohammad Hossein Boskabady, 2002).

A wound may be defined as a break in the epithelial integrity of the skin or may also be defined as a loss or breaking of cellular and anatomic or functional continuity of living tissue. According to the Wound Healing Society, wounds are physical injuries that result in an opening or break of the skin that cause disturbance in the normal skin anatomy and function. They result in the loss of continuity of epithelium with or without the loss of

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**Table 1** Treated substance for each group.

Groups	Treated substance
Group A	Wash with normal saline only
Group B	Wash with normal saline and treat with Amoxicillin
Group C	Wash with normal saline and treat with test drug

**Table 2:** observed condition of the wound on each day

Day	Control group	Standard group	Test group
0 day			
2 <sup>nd</sup> day			
4 <sup>th</sup> day			
6 <sup>th</sup> day			
8 <sup>th</sup> day			

underlying connective tissue (Strodtbeck, 2001).

Current estimates indicate the worldwide nearly 6 million people suffer from chronic wounds. Unhealed wounds constantly produce inflammatory mediators that produce pain and swelling at the wound site. Wounds are a substrate for infection and prolong the recovery of injured patients. Chronic wounds may even lead to multiple organ failure or death of the patients. Wounds are the physical injuries that result in an opening or breaking of the skin and appropriate method for healing

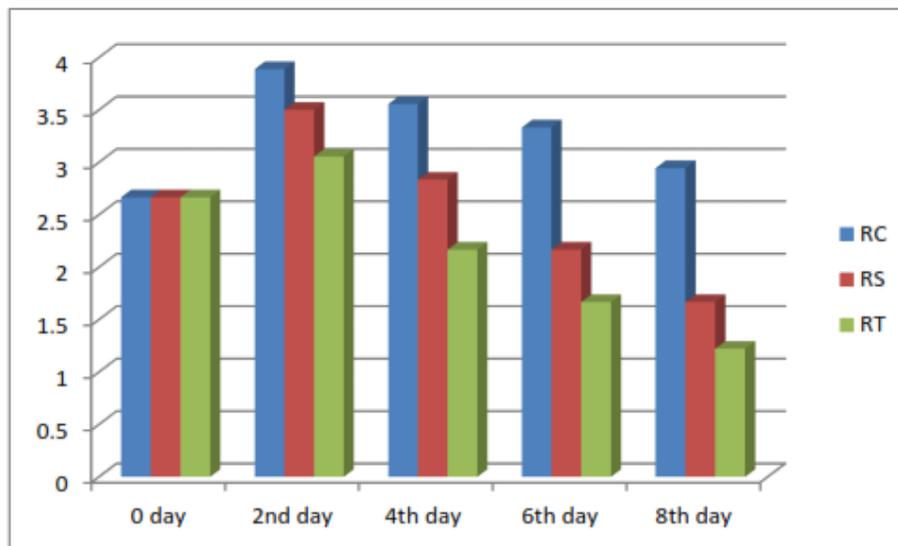
of wounds is essential for the restoration of disrupted anatomical continuity and disturbed functional status of the skin (Roberts, 1998).

## OBJECTIVE

Identify the effectiveness of *Nigella sativa* seed powder in wound healing activity on animal model.

**Table 3:** Average score of the tool for each group

Rat model	0 day	2 <sup>nd</sup> day	4 <sup>th</sup> day	6 <sup>th</sup> day	8 <sup>th</sup> day
RC	2.66667	3.88889	3.55556	3.33333	2.94444
RS	2.66667	3.5	2.83333	2.16667	1.66667
RT	2.66667	3.05556	2.16667	1.66667	1.22222

**Figure 1:** Average value of the tool for each group.

## METHODOLOGY

### Preparation of medicine

Seeds of *Nigella sativa* were identified properly by the supervisor. Then it washed with tap water thoroughly. After that it dried in sun shade. Dried seeds of *Nigella sativa* made as powder by using mechanical grinder. The powder stored air tightly and labeled (Referance).

### Experimental animals

Nine adult healthy Wistar albino rats of either sex (Body weight between 150-250 g) were used for the experimental process. They were house in standard environmental conditions, at temperature ( $25\pm 2^{\circ}\text{C}$ ), humidity ( $55\pm 10\%$ ) and light and dark (12:12 h.), fed with standard pellet diet and water.

Animals divided into three groups of each with 3 animals. Group A consider as control, group B consider as standard, group C is test group.

### Adaptation of animal

Albino rats were habitat in air conditioned well ventilated room fed with pellets thrice a day and watered per hour

The cages of every group were cleaned once in three days.

### Incision wound model

The divided each group animals were anaesthetize by giving ether (aqueous) inhalation. Hairs removed from the dorsal thoracic region of the rats. An incised wound of approximately 1cm in epidermis layer of the skin was made with No 22 scalper blade. Then Animal kept in separate cage.

### Treatment for groups

The animals were divided into 3 groups of 3 each. The animals of group A were left untreated and considered as control. Group B served as standard and received Amoxicillin. Group C was considered as test and treated with prepared test drug. Treatment procedure. Powder of test drug and standard drug were topically applied 500mg every alternative day and bandaged starting from the day of operation, till complete epithelialization up to 14 days.

### Recording and observation

Data collected every alternative day from each three

groups and recorded clearly. The direct observation of wound circumference, Exudates type and amount, records converted into Bates-Jensen Wound assessment Tool which is easy to obtain the statistical results (D.Pradhan, 2013).

## RESULT AND DISCUSSION

### Average value of the tool

Figure 3-1 described the average score of each group in Bates-Jensen Wound assessment Tool and Control group showed continuing recovery due to physiological healing during the experiment. The Test and Standard groups showed considerably minimum duration for complete wound healing. It shows that Test drug has faster recovery than Standard drug.

## DISCUSSION

The search for new pharmacologically active agent obtained by screening natural sources and plant extract has led to the discovery of many clinically useful drugs that play a major role in the treatment of human disease. Black seed is a plant which is used to make medicine for over 2000 years. Historically, black seed has been used for headache, toothache, nasal congestion, and intestinal worms. It has also been used for "pink eye" (conjunctivitis), pockets of infection (abscesses), and parasites.

"Karuncherakanth than karapanodu punnum Varunchiraip peenisamum matrum- arunthinal Kaichal thalaivalium kan valiumpomulakil Vaaicha marunthenave vai" (Theran Venpa).

According to the above quotation which is mentioned in the Kunapadam part-1 (Porut panpiyal) by K. S. Murugesamuthaliyar in page no 463, it was stated that the plant is applicable for wound.

Nine adult healthy Wistar albino rats of either sex were divided into three groups of each with 3 animals. Group A consider as control, group B consider as standard, group C is test group. Incised wound created under anesthesia and the animals of group A were left untreated, Group B served received Amoxicillin and Group C was treated with prepared test drug. The direct observation of wound size, Exudates type and amount, edges, necrotic tissue type and skin colouration of surrounding wound were records converted into Bates-Jensen Wound assessment Tool which is easy to obtain the statistical results.

Control group showed continuing recovery due to physiological healing during the experiment up to 14 days. The Test and Standard groups showed

considerably minimum duration for complete wound healing. The time duration for complete wound healing of the standard drug was observed 10 days where as Test drug, it was only 8 days. It shows that Test drug has faster recovery than Standard drug.

Sarkhail *et.al*, 2011 investigated the burn healing efficiency of Black seeds (*Nigella sativa* L.) The results of the study suggest that burn wound healing potential of seeds may be due to anti-inflammatory, antioxidant and antimicrobial activities of main compounds oil (Sarkhei, 2011). But in this study only the seed powder of *Nigella sativa* was used to heal the wound with the same activities.

Taste of Astringent is responsible for wound healing, which are reduce the Exudates amount, promote the dryness of wound and enhance the wound contraction. In Siddha treatment there are so many drugs for wound healing contain Astringent and also hot potency. *Nigella sativa* contain Suwai- Bitter, Thanmai – Heat, Pirivu-Pungent (Murugesamuthaliyar, 2013). So it is clearly denotes the *Nigella sativa* seed powder is effective on wound healing with bitter properties.

## CONCLUSION

The present study revealed *Nigella sativa* seed powder shows mark significant accelerating wound healing activity in incised wound model on wistar albino rats. The wound healing activity of Test group shows significant reduction compare to Standard. It confirms the potential value of *Nigella sativa* seed powder to be considered as a natural product wound healer.

The stanza about General character of which *Nigella sativa* is mentioned in Gunapadam text book (Porut Panpiyal ) by K. S. Murugesamuthaliyar in page no 463, was proved by scientific study.

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