



OCCUPATIONAL DERMATITIS AMONG CASHEW PROCESSING WORKERS DUE TO CASHEW NUT SHELL LIQUID EXPOSURE IN CONTAI, WEST BENGAL

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Abstract: Cashew nut shell liquid (CNSL), present between the shell layers, contains irritant compounds such as anacardic acid, cardol, and cardanol that can cause skin disorders. This study, conducted in May 2017 among 120 cashew processing workers in Contai, West Bengal, assessed the effects of CNSL exposure on skin health. Most workers handled shells without personal protective equipment. Clinical examination revealed a high prevalence of palmar keratoderma (95%), erythematous contact dermatitis (78.33%), chemical burns (25%), and nail disorders (9.16%). Poor hygiene and lack of protective measures were key contributing factors. The study emphasizes the need for improved occupational safety practices in cashew processing units.

Keywords: Occupational dermatitis, cashew nut shell liquid, anacardic acid, processing workers, contai.

I. INTRODUCTION

Anacardium occidentale, commonly known as the cashew tree, is native to Brazil and widely cultivated in tropical regions. The cashew nut shell contains a viscous, reddish-brown liquid known as cashew nut shell liquid (CNSL), which constitutes about 20–25% of the nut's weight. CNSL is a complex mixture of phenolic compounds, primarily anacardic acid, cardanol, cardol, and 2-methyl cardol. During industrial processing, especially roasting, anacardic acid undergoes decarboxylation to form cardanol and related compounds.

Although CNSL has several industrial and biological applications, its phenolic constituents possess strong irritant and corrosive properties. Direct occupational exposure, particularly in cashew processing units without adequate protective measures, can lead to various skin disorders. The most common conditions include palmar keratoderma, erythematous contact dermatitis, chemical burns, and nail abnormalities. Occupational dermatitis remains a significant health concern among cashew workers, especially in processing hubs such as Tajpur, Majna, Khalisa bhanga, and adjoining areas of Contai, Purba Medinipur, West Bengal.

The present study aims to highlight the adverse effects of CNSL exposure on human skin and to emphasize the importance of occupational safety and preventive measures in cashew processing industries.

2. Aims and Objectives

1. To evaluate skin damage caused by cashew nut shell liquid (CNSL).
2. To compare the effects of raw and roasted CNSL on skin.
3. To identify skin diseases associated with CNSL exposure.
4. To assess health risks during roasting and processing of cashew nut shell oil.

3. Study Sites

Three major cashew nut processing areas in South-West Bengal were selected for the study:

1. Khalisabhanga – Located approximately 8 km from Contai.
2. Majna – Situated about 6 km from Contai.
3. Tajpur – Located around 4 km from Contai.

These sites represent the principal cashew processing clusters in and around Contai, Purba Medinipur, West Bengal.



4. Methodology

The study included 120 cashew processing workers from different factories in Contai, Purba Medinipur. Participants were divided into 10 groups, each comprising 12 individuals. The study was conducted from May 2017 to April 2018 through monthly observations. Data were collected by face-to-face interviews using a standardized questionnaire and physical examination. Statistical analysis was performed using Microsoft Office and the Chi-square test.

5. Result

Out of 120 cashew processing workers examined, different clinical forms of contact dermatitis were observed after dermatological diagnosis.

- Palmar keratoderma was the most prevalent condition affecting 114 workers (95%).
- Erythematous contact dermatitis (ECD) was observed in 94 workers (78.33%).
- Skin burn and detachment was found in 30 workers (25%).
- Nail disorders were recorded in 11 workers (9.16%).

Age-wise distribution showed that the 18–27 years age group was the most affected in all disease categories.

Chi-Square Analysis

- Palmar keratoderma: $\chi^2 = 133.96$ (df = 3, $p < 0.05$) → Significant difference between observed and expected values.
- Erythematous contact dermatitis: $\chi^2 = 139.61$ (df = 3, $p < 0.05$) → Significant difference.
- Skin burn and detachment: $\chi^2 = 48.66$ (df = 3, $p < 0.05$) → Significant difference.
- Nail disorder: $\chi^2 = 3.18$ (df = 3, $p > 0.05$) → No significant difference.

Palmar keratoderma was the most common occupational skin disorder among cashew workers, followed by erythematous contact dermatitis. Statistical analysis revealed significant age-wise variation in most conditions except nail disorders.

Table 1: Age-wise Distribution of Different Occupational Skin Diseases among Cashew Workers (n = 120)

Age Group (Years)	Palmar Keratoderma n (%)	Erythematous Contact Dermatitis n (%)	Skin Burn & Detachment n (%)
18–27	81 (67.5%)	73 (60.8%)	24 (20.0%)
28–37	20 (16.7%)	9 (7.5%)	3 (2.5%)
38–47	8 (6.7%)	8 (6.7%)	2 (1.7%)
48–57	5 (4.2%)	4 (3.3%)	1 (0.8%)
Total	114 (95%)	94 (78.33%)	30 (25%)



Figs.1,2,3,4,5 and 6 -palmar keratoderma with skin burn,erythematous contact dermatitis,palmar keratoderma,ECD with palmar keratoderma,nail disorder and burning skin-detachments

6. Discussion

The study shows a high prevalence of occupational skin diseases among cashew processing workers. Palmar keratoderma (95%) was the most common condition, followed by erythematous contact dermatitis (78.33%), skin burn and detachment (25%), and nail disorders (9.16%). Frequent exposure to cashew nut shell liquid (CNSL) and continuous manual handling are the major causes of these lesions. Younger workers (18–27 years) were most affected, likely due to greater involvement in processing activities. Chi-square analysis showed significant age-wise differences for palmar keratoderma, erythematous contact dermatitis, and skin burns ($p < 0.05$), while nail disorders showed no significant variation. These findings highlight the need for protective measures, health education, and regular medical check-ups to reduce occupational dermatitis among workers.

7. References

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