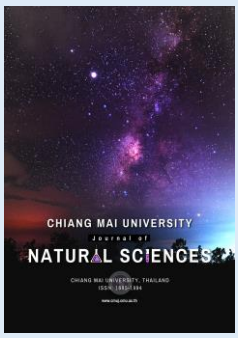

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Research article

Relationship of Respirable Dust Exposure to Pulmonary Function among Informal-sector Weavers using Indigo-dyed Cotton

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Abstract Informal-sector weavers using indigo-dyed cotton are occupationally exposed to respirable dust which may contain contaminants from chemicals used for pH adjustment in the natural indigo fermentation process. The major health problems associated with respirable dust induce pulmonary function impairment and respiratory disease. However, there have been few studies into the respiratory problems of informal-sector weavers in Thailand. This study investigated the link between occupational respirable dust exposure and pulmonary function among weavers using indigo-dyed cotton in Thailand. A cross-sectional study was conducted of 147 weavers located in Sakon Nakhon province. Respiratory dust (RD) samples were collected from the immediate breathing zone of all weavers. Lung function was measured using a portable spirometer operated by a trained physician and the spirometric results were examined by a pulmonologist before reporting. Most participants were female (98.6%) and the median reported interquartile age (IQR) was 58 (50–62.75) years. Average predicted values for FVC, FEV1 and FEV1/FVC were 92.9% (±20.7), 96.7% (±17.9) and 88.3% (±10.8). Of the respiratory function patterns of the 147 weavers, 20 (13.6%) were restrictive, 11 (7.5%) were obstructive and 1 (0.7%) was combined. The average RD concentration (mean ± SD) was 47.9 ± 28.3 $\mu g/m^3$. Multivariate linear regression models showed an increase of 1 $\mu g/m^3$ in RD exposure was associated with a 0.179% lower level of FEV1 (95% confidence interval (CI) -0.278 to -0.080) and a 0.068 % lower level of FEV1/FVC (95% CI -0.128 to -0.008). Our findings suggested that exposure to respirable dust might impair pulmonary function in informal-sector cotton weavers.

Keywords: Indigo-dyed Cotton, Informal-sector Weavers, Occupational Exposure, Pulmonary function, Respirable Dust

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