

Hypersensitivity among woodworkers in South Africa

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Summary

A group of South African woodworkers was investigated in respect of allergenic activity of three indigenous woods, yellowwood, stinkwood and blackwood, and Brazilian imbuia. Histories were taken, skin-prick tests performed, and total serum IgE levels estimated. A high rate of skin sensitivity was found, as well as previously undocumented skin sensitivities to stinkwood and yellowwood.

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The allergenic nature of exotic woods has been well documented in the literature,^{1,2} but no investigations into the allergenic properties of indigenous South African woods have been carried out. This pilot study was designed to investigate the effects of indigenous yellowwood, stinkwood and blackwood and Brazilian imbuia on 27 furniture workers, 21 of whom were fully investigated.

Subjects and methods

Occupational and medical histories were taken from all 27 participants; past and current jobs and exposures were noted. Past histories of allergy, atopy and skin abnormalities were recorded, as were current symptoms of wood-dust sensitivity. Smoking and respiratory histories were also noted. Positive histories included skin rash, nose, throat and eye irritation, and chest irritation where chest symptoms were temporarily related to wood-dust exposure.

Sera were obtained from 22 workers in a furniture factory and stored at -70°C until estimations of total serum IgE could be performed. These were carried out in triplicate using a Phadebas PRIST kit (Pharmacia).

Extracts of each wood were prepared. Blocks of stinkwood (*Ocotea bullata*), blackwood (*Acacia melanoxylon*), yellowwood (*Prodocarpus latifolius*) and imbuia (*Ocotea prosa*) were filed to produce sawdust; 5 g from each wood type was mixed with 100 ml of Coca's extracting fluid. The suspensions were maintained at 4°C with mixing for 48 hours. The slurry was then filtered through Whatman's No. 1 filter-paper and the resulting filtrate sterilized by passage through a 0,22 µm filter. Skin-prick tests were then carried out with these wood extracts, a Coca's extracting fluid control and the common allergens — compositae, grass pollen, air-borne fungi, house dust and house-dust mite.

Statistical tests were performed on the results to ascertain whether any statistically significant correlations existed between subjects with positive histories, positive IgE levels and positive skin-sensitivity reactions to wood dusts and common allergens.

Pearson's chi-squared, Yates's corrected chi-squared and Fisher's exact tests (one- and two-tailed) were used in the analysis.

Results

The mean age of the participants was 34 years (range 18 - 65 years) and the mean duration of employment in the furniture industry was 10,5 years (range 1 day - 48 years). The job composition of the group was 11 sanders (6 hand, 5 machine), 4 machinists, 3 cabinet-makers, 2 labourers and 1 each of the following: joiner, polisher, designer, manager, secretary, delivery man and driver.

Positive histories of reactions to wood dusts were found in 18 cases. The skin was affected most commonly by an irritating itchy rash (14 cases) which responded to a variety of therapeutic techniques ranging from water to steroid ointments. The eyes were next most commonly affected (11 cases), followed by the nose (8 cases), the throat (2 cases) and the chest (2 cases). Intermittent epistaxis was noted in 5 cases. The symptoms were predominantly irritation and itchiness and often resolved on removal from exposure. All 4 machinists and 7 of the 11 sanders had positive histories. Of the sanders with negative histories, 3 were hand-sanders.

Total IgE estimations were performed on the sera of 21 participants. Of these sera, 14 were positive (i.e. total IgE value 100 IU/ml). The same 21 subjects were tested for sensitivity reactions to common allergens and wood extracts; 14 subjects reacted positively to one or more of the wood extracts, and 5 of these reacted to common allergens as well. Thus 9 subjects reacted only to wood dusts, and 2 reacted to common allergens alone. Nine of the 14 subjects reacted to imbuia, 3 of these reacted only to imbuia, 5 reacted to all 4 wood types; and 1 person each reacted to yellowwood, blackwood and stinkwood only.

Nine of the 21 subjects were positive for both total IgE and skin sensitivity; 5 were positive for symptoms and IgE, and 4 of them were positive to wood extracts as well; 4 subjects were wood extract-positive but negative for symptoms and IgE, and 5 were positive for IgE and wood extracts but symptom-negative.

The only statistically significant correlation found was between subjects with a positive skin reaction to imbuia and those with a positive history of symptoms on exposure to wood dusts ($P = 0,0115$). None of the other tests reached significance, although the number of subjects who reacted to blackwood and had positive histories of symptoms tended towards significance ($P = 0,0743$). The small number of participants in the survey may have influenced this.

Conclusion

A high rate of skin sensitivity (66%) exists among this group of woodworkers. The previously undocumented finding of skin sensitivity to stinkwood and yellowwood is notable.

REFERENCES

1. Chan-Yeung M, Abboud R. Occupational asthma due to California redwood (*Sequoia sempervirens*) dusts. *Am Rev Respir Dis* 1976; **114**: 1027-1031.
2. Paggiaro PL, Cantalupi R, Filieri M et al. Bronchial asthma due to inhaled wood dust: Tanganyika aningré. *Clin Allergy* 1981; **11**: 605-610.

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