雲木香引起之菊科皮膚炎

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Compositae Dermatitis Caused by Mu-hsiang (Costus Root)

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Compositae dermatitis is a group of contact dermatitis induced by the plants of Compositae family. The major allergen is sesquiterpene lactones. The clinical manifestation includes localized hand eczema, facial eczema, or generalized eczema. The diagnosis is confirmed by careful history-taking and patch test. Herein we present a case of Compositae dermatitis due to occupational exposure to the root of costus, mu-hsiang. (Dermatol Sinica 19 : 331-335, 2001)

Key words: Compositae dermatitis, Sesquiterpene lactones, Costus, Mu-hsiang

菊科皮膚炎是由菊科引起的接觸性皮膚炎，主要的過敏原是sesquiterpene lactones。臨床上的表現很多樣化，包括手部濕疹、臉部濕疹、全身性濕疹，其診斷有賴於詳細的問診及貼布試驗。在此我們報告一例於工作環境接觸中藥材雲木香引起的菊科皮膚炎，並做一簡單文獻回顧。(中華皮誌19 : 331-335, 2001)

INTRODUCTION

Compositae dermatitis indicates the dermatitis caused by members of the Compositae(*Asteraceae*, 菊科) family of plants. Several synonyms, such as ragweed dermatitis, chrysanthemum dermatitis, and sesquiterpene lactone dermatitis, have been used in the literature.[1] The main allergen is sesquiterpene lactones. Plants of Compositae family are frequently encountered in agriculture and gardening. Besides, they are often used for cosmetics, food, or herbal drugs. The prevalence is difficult to estimate because many cases are unrecognized or misdiagnosed as other dermatoses, and different conditions of allergen exposure may also influence the count. In the series of Paulsen *et al.* from Denmark, 4.5% of the patients receiving patch test showed Compositae sensitivity.[2] On the other hand, a recent study in Singapore revealed that only 1.43% of the patients were sensitive.[3] A male preponderance has been reported, possibly

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because men were more often employed in farming and forestry.[4] However, along with the increase of females in outdoor work and gardening, the sex predilection becomes less apparent.[4,5] Compositae dermatitis often affects middle-aged and elderly persons. Young people and children are seldom sensitized. The reasons of the difference are still under investigation. We report a case of Compositae dermatitis caused by occupational exposure to mu-hsiang, and review the literature.

CASE REPORT

A 36-year-old man came to our clinic due to pruritic skin rash scattered at ears, hands, flexor side of forearms, abdomen, shoulders, and back wax and wane for about 1 year. He had been a tanner in a leather factory 10 years ago. He worked as a carrier and processor of herbal drugs at a traditional herbal pharmacy for 8 years. The skin rash often flared up whenever he carried several kinds of herbal drugs. He had been allergic to seafood and leather. On examination, many erythematous edematous plaques with papulovesicles were noted at the hands, flexor side of forearms, abdomen, shoulders, and back (Fig. 1).

Laboratory data showed normal blood cell count, slightly increased level of IgE (213 IU/mL), and negative allergen-specific IgE examination *to Penicillium notatum, Cladosporum herbarum, Aspergillus, Candida albicans, Alternaria tenuis,* mite, egg white, milk, fish, peanut, crab, and shrimps.

Under the suspicion of contact dermatitis, patch test was performed. In addition to European standard series and fragrance series, we selected several suspicious herbal drugs for the test, including tien-chi (田七, 三七, 五加科, root of *Panax notoginseng* F. H. Chen,

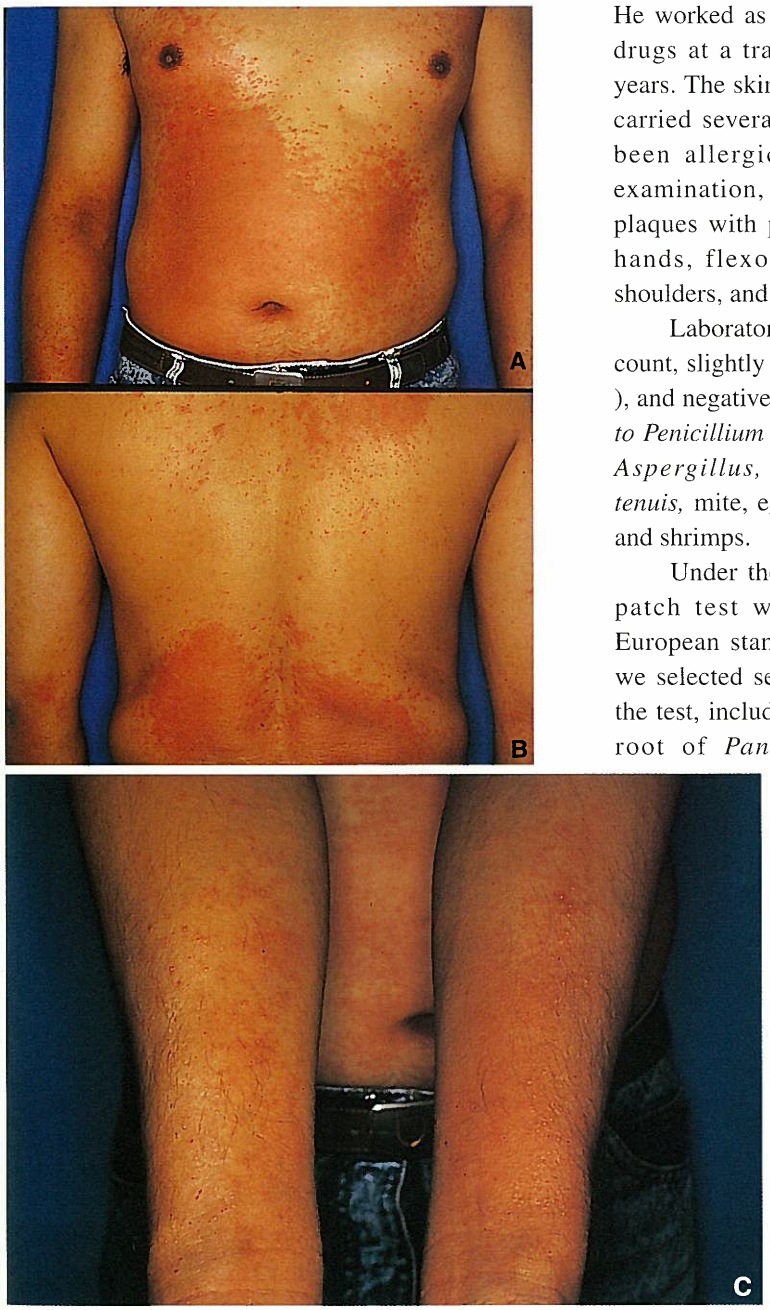

Fig. 1
Clinical pictures: multiple erythematous papulovesicles and patches over chest, abdomen (A), back (B), and flexor side of forearms (C).

Araliaceae family), sha-ren (砂仁, 薑科, fruit of *Amomum villosum* Lour, *Zingiberaceae* family), mu-hsiang (木香, 菊科, root of costus, *Saussurea lappa* Clarke, *Compositae* family) (Fig. 2) and a clean new linen bag for package of the herbal materials. These herbal drugs were ground into powder, and applied to the Finn Chambers with small amount of petrolatum. The linen bag was cut into a square of 1.5x1.5cm^2, and fixed to patient's back with 3M tape. Positive reaction could be found at the sites tested with sesquiterpene lactone mix (+++), mu-hsiang (+++), and potassium dichromate (++) according to ICDRG recommendation (Table, Fig. 3). Randomly selected 5 individuals were included as control. They showed no adverse reaction to all of them. According to the patch test data, Compositae dermatitis induced by mu-hsiang was diagnosed. Positive reaction to potassium dichromate may be related to the experience of tanning years ago.

Short-term systemic steroids were given. The skin lesions resolved in 1 week. However, similar rash recurred over dorsal aspect of hands along with lip swelling half a month later. It responded to systemic steroids soon as well.

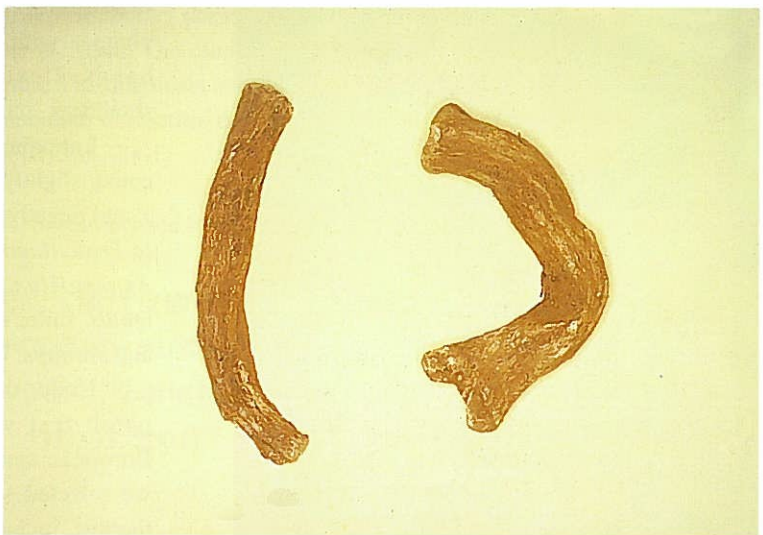

Fig. 2
Mu-hsiang, the root of costus, *Saussurea lappa* Clarke.

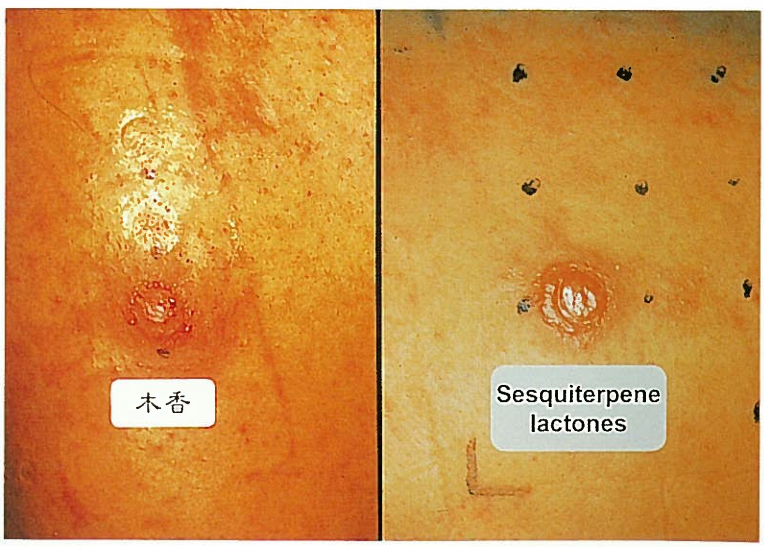

Fig. 3
Positive patch test to sesquiterpene lactones and mu-hsiang in 48 hours.

Table. Patch test results

Substance	Conc.	Vehicle	Reaction		
			48 hr	72 hr	1 wk
Potassium dichromate	0.5%	Pet	++	++	-
Sesquiterpene lactone mix	0.1%	Pet	+++	+++	Pigmentation*
Fragrance series			-	-	-
Tien-chi (田七)	as is			-	--
Sha-ren (砂仁)	as is			-	--
Mu-hsiang (木香)	as is		+++	+++	Pigmentation*
Clean linen bag	as is		-	-	-

Reading: ICDRG recommendation
Conc.: concentration; Pet: petrolatum; * hyperpigmentation after treatment with topical steroids.

DISCUSSION

The classical form of Compositae dermatitis often affects the exposure area of hands, forearms, V area of the neck, face, and ears, resulting in an itchy red scaly eczema. In the study of Ross, *et al.*, 20% of the patients presented with generalized eczema, 24% of them with eczema of the hands and face, 36% with hand eczema, and 11% with facial eczema only.[6] In places with temperate climate, patients may show seasonal exacerbation. It presents as acute vesicular and exudative eczema during the spring and summer, but with symptom-free intervals in the winter. If untreated, the skin rash may spread and persist, leading to a lichenified itchy eczema in the winter later on. Compositae dermatitis can sometimes manifest as irritant contact dermatitis or contact urticaria.[4] Our patient was exposed to the plant at workplace. Therefore, there was no apparent seasonal fluctuation of the symptoms. He often carried the material on the back or held it by arms, so the rash was more extensive.

Compositae dermatitis may be confused with atopic dermatitis, seborrheic dermatitis, airborne contact allergy, and photodermatitis. In contrast to photodermatitis, the eyelids, periorbital and retroauricular areas, and the areas below the chin are not spared.[5] However, patients of Compositae allergy may also have increased risk of developing photosensitivity.[6] Other families of plants, such as liverworts (Frullania) and bay tree (Lauraceae), may cause similar clinical symptoms.[1] In this regard, a careful patch test will be of great help.

The major sensitizing component of Compositae species is sesquiterpene lactones found in the oleoresin of the plants. More than 1,300 sesquiterpene lactones have been isolated from the Compositae plants, and at least 50 of them are known to be contact allergens.[5] The presence of an alpha-methylene group conjugated to the lactone was necessary to cause allergic reactions.[7] Sesquiterpene lactones may elicit both type IV and type I hypersensitivities. The former results in allergic contact dermatitis; the latter, hay fever, conjunctivitis, contact urticaria, or allergic asthma. A 0.1% sesquiterpene lactone mix, containing equimolar concentrations of 3 different sesquiterpene lactones (alantolactone, costunolide, and dehydrocostuslactone), is used as a safe screen for Compositae allergy.[7] Some authors suggested that sesquiterpene lactone mix is not an adequate screen for Compositae allergy since the false negative rate is relatively high. In the report of Green and Ferguson, the 0.1% sesquiterpene lactone mix picked up only 35% of cases diagnosed as Compositae allergy.[8] Therefore, in order to get more precise result from patch test, not only sesquiterpene lactone mix but the suspicious plants or additional Compositae extracts should be tested.

In our case, strong positive allergic reaction to sesquiterpene lactone mix and mu-hsiang confirmed the diagnosis of Compositae dermatitis. Mu-hsiang includes a variety of herbs in Compositae family and Aristolochiaceous family. The mu-hsiang tested here is the root of costus (*Saussurea lappa* Clarke) called yun-mu-

hsiang (雲木香), which also belongs to the Compositae family. This plant is primarily distributed in India and several southwest provinces of Mainland China. Mu-hsiang is commonly used in Chinese herbal medicine for "moving chi" (行氣), dissolving flatus, stopping diarrhea, and relieving pain. Costus root oil is sometimes used in cosmetics and perfumes. Facial contact dermatitis elicited by costus root oil in cosmetics had been reported in Japan.[9] The main constituents of costus include costunolide, dehydrocostuslactone, costic acid, costol, camphene, stigmaterol, betulin, and saussurine, etc.[10, 11, 12] In addition to costunolide and dehydrocostuslactone, cross reaction to other kinds of sesquiterpene lactones have been reported, such as arbusculin in tansy, and damsin in *Ambrosia*.[9, 13] Pyrethrum, which can be used to produce insecticide, may cross-react to costus, too.[13] In the processing of mu-hsiang, the costus root has to be sun-dried and baked, which makes it crisp and easily crushed. The surface of mu-hsiang is coated with its fine powder. It is supposed that the powder of mu-hsiang leaked through the pores of the linen bags, attached to the patient's skin and made him sensitized.

Strict avoidance of the allergen is difficult. Most sesquiterpene lactones are lipophilic molecules found mainly in the leaf, stem, and flower. Patients may be exposed to them through direct contact, as is the case we presented here. In addition, airborne contact, indirect contamination of the clothing and tools, and ingestion of the Compositae plants are all capable of initiating allergy.

Conventional treatment by topical steroids is often ineffective in severe cases. Oral corticosteroids provide good response in these occasions, but symptoms are commonly flared up after tapering of the dose. Azathioprine and cyclosporin have been tried in some cases.[4,5] A few patients showed improvement or even reached complete remission. PUVA and hyposensitization have also been mentioned in the literature but with limited value.[5] Our patient responded to oral corticosteroids well, but several episodes occurred following cessation of the medication while he remained working under the same condition. Compositae dermatitis can be easily overlooked in patients with eczematous skin rashes. Occupational details, hobbies, and living environment may give us clues. A careful patch test with suspicious plants is especially important for the diagnosis.

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