

RESEARCH PAPER

Asian herbal-tobacco cigarettes: “not medicine but less harmful”?

Aiyin Chen, Stanton Glantz, Elisa Tong

Tobacco Control 2007;16:e3 (<http://www.tobaccocontrol.com/cgi/content/full/16/2/e3>). doi: 10.1136/tc.2006.016568

Objective: To describe the development and health claims of Asian herbal-tobacco cigarettes.

Methods: Analysis of international news sources, company websites, and the transnational tobacco companies' (TTC) documents. PubMed searches of herbs and brands.

Results: Twenty-three brands were identified, mainly from China. Many products claimed to relieve respiratory symptoms and reduce toxins, with four herb-only products advertised for smoking cessation. No literature was found to verify the health claims, except one Korean trial of an herb-only product. Asian herbal-tobacco cigarettes were initially produced by China by the 1970s and introduced to Japan in the 1980s. Despite initial news about research demonstrating a safer cigarette, the TTC analyses of these cigarettes suggest that these early products were not palatable and had potentially toxic cardiovascular effects. By the late 1990s, China began producing more herbal-tobacco cigarettes in a renewed effort to reduce harmful constituents in cigarettes. After 2000, tobacco companies from Korea, Taiwan, and Thailand began producing similar products. Tobacco control groups in Japan, Taiwan, and Thailand voiced concern over the health claims of herbal-tobacco products. In 2005, China designated two herbal-tobacco brands as key for development.

Conclusion: Asian herbal-tobacco cigarettes claim to reduce harm, but no published literature is available to verify these claims or investigate unidentified toxicities. The increase in Asian herbal-tobacco cigarette production by 2000 coincides with the Asian tobacco companies' regular scientific meetings with TTCs and their interest in harm reduction. Asia faces additional challenges in tobacco control with these culturally concordant products that may discourage smokers from quitting.

See end of article for authors' affiliations

Correspondence to:
Elisa Tong, 4150 V Street,
PSSB #2400, Division of
General Internal Medicine,
University of California,
Davis, Sacramento,
California 95817, USA;
ektong@ucdavis.edu

Received 7 September 2006
Accepted 12 October 2006

Smoking in Asia has become a public health crisis, with East Asian countries having 38% of the world's smokers.¹ The high smoking prevalence is complicated by the fact that many countries have state-run tobacco monopolies, including China, with 360 million smokers.² Japan Tobacco International is the world's 3rd largest transnational tobacco company and is 2/3 owned by the Ministry of Finance.³ Korea, Taiwan, and Thailand all have had tobacco monopolies as well.⁴⁻⁶ The entry of transnational tobacco companies (TTCs) into the Asian markets in the 1980s has led to higher rates of cigarette consumption than would have been otherwise expected with the native tobacco monopolies alone;⁷ the TTCs are now particularly interested in entering the large Chinese market.^{8,9}

Asian herbs have been used for medicinal purposes for centuries¹⁰ and, beginning in 2000, several Asian countries started producing cigarettes that combine these herbs with tobacco. (The herbs used in Western herbal cigarettes, in contrast, use ingredients such as hazel and rose petals that are not considered medicinal nor are mixed with tobacco.^{11,12}) Asian herbal-tobacco cigarettes may appeal to Asian smokers who believe they are deriving a health benefit from smoking these products. Correspondingly, the TTCs and a 2001 Institute of Medicine report have encouraged the creation of potentially reduced exposure products (PREPs), which may deliver fewer toxins to smokers who are unwilling or unable to quit.¹³ The strategy of product modification as a form of tobacco control has been criticised by some public health groups and researchers, however, because there is no evidence of a public health benefit at the population level^{14,15} and this strategy may discourage current smokers from quitting.¹⁶

Little is known about Asian herbal-tobacco cigarettes, so we sought to describe their development and product

characteristics by examining international news accounts and internet sites for product descriptions and health claims. We also used the TTCs documents to determine the level of awareness and interest in the development of these products. Asian herbal-tobacco cigarettes that claim to reduce the harms of smoking have been developed in China since the 1970s and the TTCs have been tracking these products since the 1980s. In 2000, other Asian countries tried to develop similar products, which coincides with efforts by the TTCs¹⁷ to work with Asian tobacco companies in promoting their “harm reduction” strategy in Asia.

METHODS

We collected brand information from news accounts published between January 1999 and June 2005 through www.tobaccocontrol.com, a tobacco control website that collects international news. Further searches of accounts between January 2000 and June 2005 were conducted in China's tobacco news website (www.tobaccochina.com), for which we translated articles from Chinese into English if necessary. The search engine www.google.com was used to locate information on specific brands and Asian herbal-tobacco cigarette companies. Herbal-tobacco cigarettes for which we could not locate any information except brand names were excluded.

To gather transnational tobacco company information about these products, we searched previously secret tobacco industry documents made public through litigation in the US. The

Abbreviations: ARTIST, Asian Regional Tobacco Industry Scientists Team; JTS, Japan Tobacco & Salt Public Corporation; KFDA, Korean Food and Drug Administration; PREP, potentially reduced exposure product; TTC, transnational tobacco company; TTWMB, Taiwan Tobacco and Wine Monopoly Bureau

University of California San Francisco Legacy Tobacco Documents website (legacy.library.ucsf.edu) and British American Tobacco Documents Archive (bat.library.ucsf.edu) contain 45 million pages of internal tobacco industry documents. Searches using standardised techniques, such as narrowed searches using Boolean terms and snowball techniques of surrounding Bates identification document numbers, were completed between July 2003 and June 2005. Keyword searches included “herbal cigarette,” specific brand names, cigarette companies, and herbs.

To investigate the clinical effects of the herbs, we searched PubMed for herbs and brand names. We did not search additional Asian scientific publications due to language and access barriers. Through one of the Korean herb-only products’ websites,¹⁸ we followed a link to KoreaMed,¹⁹ a Korean search engine in English similar to PubMed, and conducted further searches; we did not find a similar search engine for other countries.

RESULTS

Overview

We found 40 international news articles on China, one on Japan, four on Korea, one on Taiwan, and two on Thailand. From the tobacco company documents, we found 119 documents on China, 32 on Japan, seven on Korea, five on Taiwan, and none on Thailand relating to herbal-tobacco cigarettes. The TTC documents provided early news accounts and TTC activities regarding China, Japan, and Taiwan. The international news articles helped describe Chinese, Korean, and Thai products after 1999. Most information on South Korean products is collected from company websites.

We identified 23 brands of Asian herbal-tobacco cigarettes produced between 1959 and 2004 (Table 1): 15 made in China, six in South Korea, and one each in Taiwan and Thailand.

Eleven brands list a primary herbal ingredient and eight brands report a mixture of herbs, which are not necessarily disclosed. Only four of the 23 brands explicitly state they contain herbs only. Two brands do not contain a typical herb: one product has loess, the top layer of silt soil, and another product has selenium-rich tobacco leaves. Among the 18 Asian medicinal herbs listed as ingredients, ginseng was the herbal product most commonly used (four brands) followed by *Apocynum venetum* (two brands). While the products do not necessarily describe how their ingredients are combined, four methods have been described by Chinese scientists: herbal extracts mixed with tobacco leaf (most common), herbs directly mixed with tobacco leaf, herbal extracts sprayed on shredded tobacco, or herbal extracts sprayed directly on the acetate fibre of the filter.²¹

The health claims of the Asian herbal-tobacco cigarettes ranged from reducing smoking-related symptoms and health risks to assisting in smoking cessation (table 1). Most brands (21 of 23) state they reduce harmful substances (for example, nicotine, tar, carbon monoxide, carcinogens, mutagens) in the cigarettes. Health claims include 12 brands that relieve respiratory symptoms, 10 that reduce toxic substances like carcinogens or tar, four that protect internal organs, and three that boost immunity. Four brands, which contain herbs only, were advertised as smoking substitutes or cessation aids. We could not find any health claim information for two brands.

We conducted a PubMed search of the 21 herbal ingredients, and no literature was found about the efficacy of inhaling or combusting herbs or in combination with tobacco. We found an English abstract of a Korean randomised controlled trial²² through KoreaMed¹⁹ for one herb-only product through its company’s website.¹⁸ No other relevant literature was found on KoreaMed. Other literature in PubMed suggested effects,

mostly dietary, for smoking-induced damage. Green tea, tea polyphenol, and other Chinese herbs (*Scutellaria barbata*, *Hedyotis diffusa wildi*, *Xihuanguan*) reportedly inhibited damage to DNA in lymphocytes caused by the total particulate matter extracted from cigarette tar, and the authors from Shandong Medical University’s Department of Environmental Health recommend injecting the material into cigarettes.⁴⁷ (We did not find products listing these Chinese herbs.) Other literature on dietary consumption of green tea^{48,49} and red ginseng⁵⁰ suggest a potential dietary role for cancer prevention with smoking.

China: leading producer

Between 1959 and the early 1970s, China was the first country to develop herbal-tobacco cigarettes, initially for treating asthma and bronchitis patients. Nanjin Herbal Company was the first to make YangJinHua brand by mixing *Flos daturae* herb with tobacco to treat asthma.^{20,21} Tianjin Cigarette Factory developed another brand Anti-Asthma in the early 1970s with an unknown herbal ingredient. According to a 2002 Chinese news article,²⁰ Tianjin hospital had observed these Anti-Asthma cigarettes to be 98.6% effective in relieving symptoms of asthma and bronchitis among 140 asthmatic patients. However, the production was small and the cigarettes required a prescription for medical use.

Similar to these early products but not requiring prescriptions, China’s two oldest major herbal-tobacco brands, Changle and Zhongnanhai, reportedly lessened the smoking-related symptoms of habitual smokers. As reported in a Japanese news article entitled “China Develops ‘Safe Cigaret’ Reputed to Have Medicinal Effect Versus Heart Disease and High Blood Pressure,”²⁵ Beijing Cigarette Factory collaborated in 1973 with China Medical Institute, Beijing University No.2 Hospital, and Beijing Municipal Science Committee in a six year project to develop an herbal-tobacco cigarette for smokers.²⁵ The cigarettes were not initially favoured by customers because of the bitter taste.³⁸ In 1979, the final formula was improved by mixing 99% tobacco with 1–1.5% *Apocynum venetum* to create the herbal-tobacco cigarettes Changle and Zhongnanhai.^{25,38} (These products reportedly received a US. patent in 1986,^{21,31} although we did not find any evidence that these products were available in the US.)

In 1980, Philip Morris received an invitation to visit from Beijing Cigarette Factory, who reported that their product Changle had harm reducing properties.⁵² Philip Morris files contain a summary document describing research by Beijing’s Chao Yang Hospital on Changle, entitled “Observation on treatment of chronic bronchitis with cigarette containing extratum of Chinese medical herbs and its influence to pulmonary functions.”⁵³ The study had 100 subjects, half of which were randomly assigned to smoke the herbal-tobacco cigarette for 2 months. According to the document, 65.9% of the Changle group reported the product “markedly effective” compared to 23.8% of the regular cigarettes,⁵³ and “markedly effective” was specified in a separate news article as some relief with less coughing and phlegm.²² The patients were given a complete physical exam, a hematologic exam, and a pulmonary function test; only “slight improvement” in pulmonary function was noted for the Changle group.⁵³ (The tobacco documents do not provide further detail about the various tests performed, nor do they specify what “slight improvements” mean.) We did not find evidence that Philip Morris visited Beijing, but they tracked the products’ success: Changle and Zhongnanhai were distributed in China and Hong Kong by 1982 and in Japan by 1986.²⁵ By 1988, 45 of China’s 145 cigarette factories produced 52 brands of herbal-tobacco cigarettes, with the Beijing-made cigarettes being the best

Table 1 Description of Asian Herbal-Tobacco Cigarette Brands and Health Claims

Brand (translation)	Herb*	Country	Year Produced	Health Claim
Anti-Asthma ^{20 21}	Unknown	China	1970	Relieves asthma
Changle ²²⁻²⁶ ("Long Happiness")	1% Apocynum venetum	China	1982	Reduces toxic substances and nicotine Relieves bronchitis, cough, and asthma
Green Oriental ²⁷	18 herbs	China	2004	Raises immunity Protects kidney Reduces phlegm production
"Guocao" ²⁸ (Name of company)	Herb only: Mugwort (Artemisia vulgaris) and other herbs	China	2003	Cigarette substitute Relieves asthma and phlegm Increase immunity Fever relief and sedation Protect liver and gallbladder Reduce blood pressure
Hsiang Yang Ginseng ²⁹	Ginseng	China	1986	Unknown
JinJian ³⁰ (export name of Changle)	1% Apocynum venetum	China	1982	Reduces toxic substances and nicotine Relieves bronchitis, cough, and asthma
JiangShan ³¹ ("River & Mountain")	herbaceous peony, thoroughwort, curculigo rhizome, longspur epimedium	China	2000	Reduces tar level
JinSheng ³² ("Golden Saint")	Herbal mixture	China	1996	Reduce free radicals and harmful substances Protects kidneys
KangXi ³³ (Name of Emperor)	Tropaeolum peregrinum	China	2000	Reduces harmful substances Protects lung and liver Relieves cough, phlegm, and inflammation
Puleye ³⁴	Puleye herbal extract	China	2001	Reduces carcinogens, mutagenicity and acute toxicity
QunYingHui ³⁵ ("Elite")	18 herbs	China	2004	Reduces harmful substance
Wuyeshen ³⁶ ("Five-leaf Magic")	"Shennong extracting liquid"	China	2000	Reduces carcinogenic substances (including nitrous ammonia and nicotine) Readjusts immune system Reduces oxidative and mutagenic injury Reduces cough, sore throat
YangJinHua ^{20 21} (Name of herb Flos daturae)	50% Flos daturae	China	1959	Relieves asthma
YiXing ³⁷ ("Changing Stars")	40 herbs only: radix ginseng, fos caryophylli, herba menthae, and radix polygalae	China	1997	Cigarette substitute Relieves fatigue, cough, and sputum production
Zhenxi ³² ("Precious Selenium")	Selenium-rich tobacco leaf	China	1996	Reduces levels of tar, benzo(a)pyren, and free radicals
Zhongnanhai ^{25 38} (Name of place where emperor lives)	Apocynum venetum	China	1982	Treats tracheitis and pulmonary heart disease, phlegm, and cough Reduces side effects from tar, nicotine, and carbon monoxide
Blue ³⁹	Herb only: Artemisia absinthium	Korea	2002	Cigarette substitute Increases blood circulation "Purification effect" with simultaneous cigarette use
Figo Super Lights ⁴⁰	Loess	Korea	2002	Reduces harmful components like nicotine, tar, carbon monoxide.
GT ³⁹	Green tea	Korea	2003	Removes harmful components like carcinogens
NosmoQ ^{41 42} ("Herb that stops smoking")	Herb only: Eucommia ulmoides	Korea	1996	Smoking cessation
Sante Luxury ⁴³	50 substances including ginseng and honey	Korea	2003	Unknown
V ⁴³	Lao herbs	Korea	2004	Reduced lung and throat irritation
SINOX 100 ⁴⁴	10 herbs including Eriobotrya japonica and Pericarpium Citri Reticulatae.	Taiwan	1999	Helps respiratory system
Herbal Krongthip ^{45 46}	Andrographis paniculata	Thailand	2000	Relieves throat irritation Increases saliva production

* Herb and tobacco combined, unless otherwise indicated as herb only.

sellers, and China's herbal-tobacco cigarettes had an output of 42.5 million cartons in 1987.²¹

Various global news accounts collected by the TTCs described Changle as "health promoting" with less coughing, decreased phlegm production, curative properties for bronchitis, and restored lung function; these news accounts also included testimonials of customers feeling less cough and discomfort after smoking Changle.²²⁻²⁶ While news accounts focused on the health benefits, the clinical trial investigator at the Beijing hospital warned in a tobacco industry trade journal Tobacco International that the cigarettes were still not helpful to one's health.²² A researcher from China's tobacco monopoly also

stated that, "'Medicinal cigarette' is not a proper name. We prefer to call it 'new cigarette.' It's not medicine. It remains a cigarette, still harmful, but less so."²¹

Three TTCs investigated these Chinese herbal-tobacco cigarette products for their components. Brown & Williamson's product development department was the first to test Changle in 1982, and found that the Apocynum herb contained glycosides, a powerful cardiotonic agent similar to digitoxin. The taste seemed unacceptable to US smokers, as "the organoleptic sensations range from metallic, sour and fishy with the first puffs, to salty, fecal, and bitter with the final puffs."³⁰ A memo sent to Brown & Williamson's Director of

Research and Development advised not to pursue further investigation of Changle (also called by its export name JinJian), given the difficulties in evaluation and negative product aspects:

“Verifying the health claims for JinJian cigarettes is beyond the scope of this examination. Lacking the extract, the purported reductions in carbon monoxide and nicotine are also impossible to verify. Additionally, the negative smoke quality of the cigarettes offers no incentive for continued interest. Most importantly, the toxicity of the extract precludes its usefulness. For these reasons, no further work is planned.”³⁰

Likewise, R.J. Reynolds compared the cigarette smoke condensates of these Chinese products with their own products, using an Ames bioassay, and found that the smoke condensate of JinJian and Zhongnanhai were “no less mutagenic than that from normal cigarettes.”³⁴ Philip Morris sent packs of Changle and another brand (Liushuiyan) to its Research and Development office in 1987.²⁵ Philip Morris tests reported that the smoke components of the cigarettes did not differ from that of Marlboro, but Changle contained trace levels of atropine.⁵⁵ In 1994, Philip Morris continued reporting about these products, such as smoke and filter components, as part of their tracking efforts on various Asian market products.^{56–59}

In June 1997, TTC representatives were invited to a China tobacco monopoly meeting about “accomplishments in the reduction of harmful constituents in cigarettes”, which included an update about China’s herbal-tobacco cigarettes.³² One TTC scientific representative, Mingda Zheng, reported back to Philip Morris that various short-term animal and clinical trials had been performed in China on these herbal-tobacco cigarettes, but that the Chinese hosts admitted: “[t]he main obstacles in the development of such cigarettes were reported to be in maintaining the effectiveness of the medicinal materials after burning and the potential effects of the medicinal ingredients on flavour.”³² Highlights reported at the meeting included a low tar version of Zhongnanhai that had been produced since the end of 1995, and “about 5000 “large cases” have been “exported” (destination not quoted) by the end of 1996.”³² The product Zhongxi from Hubei province was reported at the meeting to be “10 times higher in selenium, 19.5% lower in tar, 22.5% lower in benzo(a)pyrene, and 27.1% lower in free radicals as compared to control cigarettes made with tobacco leaves from other sources.”³² The product JinSheng had won a gold medal from the 24th Geneva Exhibition of New Technologies and New Inventions.³² In a separate report, Philip Morris noted it was the first herbal-tobacco cigarette launched in the Hong Kong market in 1996 as a luxury class (Hong Kong \$26).⁶⁰ Developed with the Jiangxi University of Traditional Chinese Medicine, Jinsheng had sold a record 200,000 cartons from 1995–2003, with profits and taxes reaching 4.8 billion yuan.⁶¹ Exports to the Southeast Asian markets exceeded US\$700 000.⁶²

Products developed after 2000 were reported by TobaccoChina.com to have demonstrated health benefits often through scientific research collaborations, although no scientific publications were named or found in PubMed: Wuyeshen, KangXi, JiangShan, Puleye, QunYingHui, and Green Oriental.^{27 34 35 63–66} News articles reported research on the toxicity, pharmacology, and effect of the product Wuyeshen had been conducted over 3 years by various state-level organisations: China Academy of Medical Sciences, China Diseases Prevention and Control Centre, China Academy of Military Medical Sciences, the Union Medical University, the State Centre for Test and Analysis, the Animal Research

Institute of China Academy of Sciences, and the state Zhengzhou Tobacco Research Institute.⁶⁵ One news article stated that the research on Wuyeshen demonstrated it reduced the harms of smoking:

Research results showed that the natural herbal extract 1) has no toxic side effects, causes no addiction, and is good for chronic use, 2) dramatically suppresses the toxic effects of the carcinogen in cigarettes, 3) greatly reduces the content of nitrosamine and nitrosamine by 61.5% compared to regular cigarettes, 4) has antimutagenic effects according to SCE testing (with human lymphatic cells), 5) produces less toxicity to mice which ingested the product into the stomach, 6) and repairs a damaged respiratory tract. 7) Mice that smoked 70 Wuyeshen had a survival rate of 100%, compared with the 15% when smoking regular cigarettes. For secondhand smoke, it reduces the toxic effects to mice and increases survival dramatically, 8) stops coughing, dyspnea, phlegm production, and improves circulation.[translated by author]³⁶

(No literature in PubMed was found to verify these findings.) A news article reported that the product Kangxi had been evaluated by Beijing Medical University,⁶⁵ who demonstrated that the “tar level of the product reduced 60% and the amount of pyrene benzene and benzoic acid amine declined 55.3% and 28.6% separately.”⁶⁵ Furthermore, after rats smoked the product for 40 days, “lung pathology” was demonstrated in 83.3% of the control group but only 9.1% of the Kangxi group, comparable to normal animals.³³ The product JiangShan was evaluated by the Zhengzhou Tobacco Research Institute, Xi’an Transportation University, Tianjin Traditional Chinese Medicine Institute, and Element Research Institute of Nankai University; a news article reported these organisations demonstrated that JiangShan reduced harmful substances through their “animal toxicity studies.”³¹ The product Puleye had an herbal extract that was developed by Harbin Jindu Pule Industrial Co. Ltd. after ten years of research, and a news article stated Puleye’s effectiveness at controlling environmental carcinogens and tar in smoke was “proven” after six years of experiments conducted by Kunming Animal Research Institute of China Academy of Sciences, the Environmental Sanitation Monitoring Institute of China Sciences Academy for Prevention Medical Science, and Harbin Medical University.³⁴ A news article reported that the product QunYingHui had been tested by the Zhengzhou Tobacco Research Institute to conclude that “the content of acrylamide and nitroso in deferred smoke” were lower than other cigarettes by 30–50%.³⁵ The news also reported that the product Green Oriental had used “up-to-date technology” to reduce the harmful components, and the brand’s green feature symbolised “environmental protection.”²⁷

Two herb-only products have been promoted as cigarette cessation aids. The “Guocao healthcare smoking product,” developed by Nanyang Guocao Science & Technology Development Co., was reported in the news to have “been designated as a substitute product for cigarette [sic] by China Association of Smoking and Health, which agrees that the successful development of the product will help many Chinese smokers reduce the harmness[sic] caused by smoking and even abandon [sic] smoking habit for increase of health.”²⁸ The second product, Yixing, developed by Henan TianSheng Science Development Limited Company, looks like a cigarette but uses the inhalation of herbs without burning it. The company website stated the effect “makes nicotine start to release and excrete from the body ... and the addiction to nicotine is thus rooted up ... without any withdrawal symptoms”; 6 days of 24 pieces is advertised as helping one quit or else 2–3 pieces a day

for one week as helping one reduce cigarette consumption.³⁷ The company's website also shows a "certificate of FDA clearance is awarded in August 1998" into the United States.³⁷ While this "FDA certification" could be misunderstood as an approval of health claims, the certification only refers to importation.

At least two Chinese brands have appeared in the US market, and may become more widespread as China consolidates and promotes its cigarette brands. In June 2005, Wuyeshen was sold in San Francisco, California for US\$4.50 per pack. Another brand Hsiang Yang Ginseng was reported by PM in 1996 to have been available in New York's Chinatown since 1986.²⁹ In 2005, Jinsheng and Zhongnanhai have both been identified by China's State Tobacco Monopoly Association as two of the "Top 36 Chinese Cigarette Brands" designated for development out of China's hundreds of brands.⁶⁷ (Detailed market share is not released by the Chinese government.) Jinsheng already has an annual production of 70 000 cases (3.5 billion cigarettes) in 2003.⁶⁸ The Zhongnanhai brand name has already reached "US\$244 million in its intangible assets in 2001" per its company's website.⁶⁹

Japan: importing chinese products

Japan's interest in Chinese herbal-tobacco cigarettes started in 1984, as documented through news articles Philip Morris collected.⁷⁰ The Japan Tobacco & Salt Public Corporation (JTS) was the state monopoly that controlled the Japanese market at the time. According to a Japanese news article,⁷⁰ JTS learned about Zhongnanhai and requested that Japanese delegates to Beijing bring back a sample. Initially the delegates were unsuccessful because of the reported secrecy and limited distribution of the brand, but eventually a sample was obtained from a Beijing cigarette factory. JTS analysed the product, detecting that the tobacco leaves were soaked in the herb *Apocynum venetum* and contained an atropine-like compound.⁷¹ The pack had a printed notice: "This new product is safe for use and effective in loosening phlegm and suppressing coughs." The news article concluded that the Chinese brand would be helpful in developing future Japanese products.⁷⁰

While three Chinese brands were reportedly sold in Japan,⁷² Japan apparently did not develop its own herbal-tobacco cigarettes. Zhongnanhai and Changle (translated as Chunankai and Choraku in Japanese) were sold in Japan in 1986, with Japan importing 355 000 cartons worth US\$800 000 in the first 8 months.³⁸ Changle's export brand, JinJian, was available in Japan by 1992,⁷³ but was discontinued for unknown reasons by 1993.⁷⁴ Although the market was relatively small in Japan (market share 0.09%),⁷² both Zhongnanhai and JinJian were still sold in 2000.^{75 76} One possible reason Japan did not develop its own herbal-tobacco cigarettes is that in 1988 after the Chinese products were introduced, a Japanese "civic group...issued an open letter to importers and distributors of tobacco products questioning the contents of Chinese herbal-tobacco cigarettes billed in Japan as "health cigarettes""; Japan's Anti-Smoking Information Centre also stated that any tobacco containing tar and nicotine "is unhealthy."⁷⁷

South Korea: mixed health claims

In 1996, an herb-only cigarette called NosmoQ, whose Korean name "Kumyeoncho" means "herb that stops smoking," was created with *Eucommia ulmoides* by a private company 3G Care. Philip Morris learned of news accounts reporting that the Korean Food and Drug Administration (KFDA) approved of NosmoQ as a smoking cessation aid in 2001, after the Korean Ministry of Health and Welfare had reclassified all smoking cessation products as drugs in 2000.⁴¹ According to the news,

NosmoQ was tested in the KFDA labs and found not to be harmful to "neural, genetic, or immune systems."⁴¹ Upon hearing about the KFDA approval of NosmoQ, the vice president of PM Worldwide Scientific Affairs was alerted to "present to the Korean FDA our [Philip Morris] thinking regarding development and assessment of potentially harm-reduced products."⁴¹ However, we did not find any evidence of further action.

A research publication in the *Journal of Korean Academic Family Medicine* concluded that NosmoQ was similarly effective in helping people quit smoking when compared to nicotine patches.⁴² Conducted by Dankook University professor YS Cheong, the abstract describes a 6 month randomised clinical trial of 200 volunteers that reported no significant difference in quitting between participants using NosmoQ and nicotine patches after 1 month (54.5% vs. 50.7%, $p = 0.64$), 3 months (41.4% vs. 39.4%, $p = 0.87$), and 6 months (38.8% vs. 35.2%, $p = 0.75$). Adverse effects in using NosmoQ included nausea (25.5%), coughing (6.1%), dizziness (5.1%), and palpitation (1.0%).⁴² The article stated that Dankook University provided research funds, while the company donated samples of the product.

Four herbal-tobacco cigarettes with tobacco have been produced since 2002 after the privatisation of the Korea Tobacco and Ginseng state monopoly. The brands Figo, GT, V, and Sante Luxury were developed by biotechnology and trade companies.⁴³ Instead of being promoted as a smoking cessation aid like NosmoQ (a herb-only cigarette), these cigarettes were promoted as reducing the harms of smoking. Figo's addition of loess, the top layer of silt soil, purportedly "reduces the smoke by 1/3 to 1/4 via the filtering effect of the loess,"⁴⁰ as stated by the company website. Another brand GT was made by soaking the tobacco leaves in green tea nine times, with the company website claiming that GT "doesn't contain any harmful components like carcinogenic material thanks to the catechine ingredients of green tea so consumers [sic] feel free to smoke without considering the [sic] health."³⁹ A news article reported that the product V claimed to not hurt smokers' lungs and throat as regular cigarettes do, and that Sante Luxury was made of 50 herbal substances (no health claims were listed).⁴³ Blue, an herb-only cigarette made of *Artemisia absinthium*, is produced by the same company that produces GT and advertised in the company website that it "helps you easily quit smoking."³⁹ Blue and Figo were advertised to be sold in the US. in 2002 and 2003 respectively.⁷⁸⁻⁸⁰

Taiwan and Thailand: short-lived efforts

The Taiwan Tobacco and Wine Monopoly Bureau (TTWMB) developed its first herbal-tobacco brand, SINOX 100, in 1999. According to news articles collected by Philip Morris,^{44 81} the TTWMB had been exploring the potential of herbal-tobacco cigarettes since 1988. In response to the increase in imported regular cigarettes and the growing anti-smoking campaign in Taiwan, TTWMB officials wanted the "healthy" cigarette to help regain lost market share with reversing the negative image of smoking. However, smokers reported it tasted like a light cigarette and thought that chain smokers would find it unsatisfactory.⁴⁴ The anti-smoking group John Tung Foundation also stated that herbal-tobacco cigarettes could be as hazardous as regular cigarettes and that the burning of tobacco was still detrimental to health.⁴⁴

The Thailand Tobacco Monopoly developed its herbal-tobacco brand Herbal Krongthip in 2000.^{45 46} The cigarettes contained *Andrographis paniculata* oil, an herbal product traditionally used to treat cold symptoms for its soothing effects on sore throat. The additives were proposed to increase saliva secretion and thus relieve throat irritation from smoking. The monopoly

wanted Herbal Krongthip to help with the decrease in cigarette sales, which was attributed to an increasing health consciousness and the country's economic crisis.⁴⁶ In response, Thailand's Action on Smoking and Health Foundation stated that the new product would attract consumers to smoke more and therefore increase the rate of addiction.⁴⁵ The monopoly denied that its aim was to increase smoking, asserting that the herbal-tobacco brand gave consumers a new flavour choice and would not mislead smokers to think that the cigarettes contained medicine.^{45–46} Herbal Krongthip was advertised for US\$3.80 in an internet catalogue, which now states sales were stopped in 2002.⁸²

DISCUSSION

Asian herbal-tobacco cigarettes, which incorporate Asian herbs traditionally used for medicinal purposes, were initially produced by China, introduced to Japan, and later produced by Korea, Taiwan, and Thailand. Many products claimed to relieve respiratory symptoms and reduce toxins, with four herb-only products advertised for smoking cessation. No literature was found to verify the health claims, except one Korean trial of an herb-only product. Despite initial news about research demonstrating a safer cigarette, the TTC analyses of these cigarettes suggest that these early products were not palatable and had agents that had potentially toxic cardiovascular effects. By the late 1990s, China began producing more herbal-tobacco cigarettes in a renewed effort to reduce harmful constituents in cigarettes. After 2000, tobacco companies from Korea, Taiwan, and Thailand began producing similar products. Tobacco control groups in Japan, Taiwan, and Thailand voiced concern over the health claims of herbal-tobacco products. In 2005, the China State Tobacco Monopoly Association designated Jinsheng and Zhongnanhai as two of its top 36 brands for development out of hundreds of brands. These herbal-tobacco products will likely continue to grow in market share in China and abroad, although this will be difficult to track since China does not release market share information.

The resurgence in Asian herbal-tobacco cigarette production with different Asian countries coincides with the awareness of the Asian tobacco companies about the smoking and health regulatory issues challenging the TTCs. Since 1996, the TTCs, led by Philip Morris, held regular meetings with scientific representatives from all of these countries as an inter-industry Asian Regional Tobacco Industry Scientists Team (ARTIST); Philip Morris hoped ARTIST would help “to move our reduced harm efforts forward.”¹⁷ The Korean NosmoQ product had alerted Philip Morris' scientific executives into initiating a discussion with the Korean Food and Drug Administration about the TTCs plans for “potentially reduced exposure products” (PREPs).⁴¹ It is unclear why Japan never produced an Asian herbal-tobacco cigarette but Japan Tobacco, who has collaborated closely with Philip Morris on smoking and health regulatory issues since the 1980s,⁸³ may have shared similar concerns about the success of the products. Instead, PREPs were made for the Japanese market in 1996 by R.J. Reynolds Tobacco (whose international division was later bought by Japan Tobacco) called Salem Pianissimo, a cigarette with less smell and smoke that targeted the “clean” aspect of Japanese culture.⁸⁴ (Most smokers, however, who have tried the PREPs do not like them.⁸⁵)

Concerns about the health effects of the Asian herbal-tobacco cigarettes may also have affected the development or promotion of these products. Public interest groups in Japan, Taiwan, and Thailand had questioned whether these products could be deemed healthy when tar and nicotine were still part of the product. Other health effects from combusting herbs have not been thoroughly investigated, nor has the consequence of

having compounds like digitoxin and atropine in the herbal-tobacco cigarettes.^{30–55} Flos datura, an anticholinergic herb used by the early Chinese YangJinHua brand, is thought to cause the majority of poisonings after ingesting Chinese herbal medicine, and some ginseng preparations might be adulterated with scopolamine and other herbs.⁸⁶ Cardiovascular toxic effects may not require large doses as demonstrated by ma huang, an herbal dietary supplement of ephedrine.⁸⁷

The quality of the reported research on these herbal-tobacco products is difficult to determine, since the news articles, tobacco documents, and company websites do not provide more than general summaries of the studies evaluating these products. The health claims were legitimised, mostly for Chinese products, by listing collaborators as being health or research organisations. We did not find scientific publications to help verify the products' health claims either, except for the Korean randomised controlled trial of the herbal-only product in KoreaMed. This lack of literature likely reflects that the study quality of Chinese herbal medicines are generally poor in methodology and analysis, even in Chinese language journals, as reported in a review⁸⁸ of published clinical trials of Chinese herbal medicines for acute respiratory infections.

The history of menthol cigarettes may provide insight into the future of Asian herbal-tobacco cigarettes. Early menthol cigarettes such as Kool were promoted as “healthier” specialty brands⁸⁹ that can “soothe and comfort the throat.”⁹⁰ Claims related to health were prominent in early advertisements, and smokers responded by switching from regular cigarettes in hopes to reduce their health risk.⁹¹ In 1952, several articles on smoking-related cancer risks were published, and by the mid 1950s, explicit health references were removed from advertisements to avoid reminding people about the health consequences of smoking,⁸⁹ although the medicinal connotation of menthol remained.⁹⁰ By 1956, menthol brands like Salem and Newport entered the market and were promoted as brands with an alternative flavour rather than a medicinal effect.⁸⁹ Asian herbal-tobacco cigarettes may similarly evolve by removing or downplaying health claims, such as with the Thailand product, but remain intrinsically appealing to smokers.

Limitations

We did not obtain direct information from the different Asian tobacco companies, nor did we search news sources in all the Asian languages. We also did not search additional Asian scientific publications beyond our PubMed search, which includes Asian language publications, to verify the reported scientific and clinical product effects or herbal actions. Future investigation can determine market share and smokers' attitudes for these products.

What this paper adds

Asian herbal-tobacco cigarettes, which incorporate Asian herbs traditionally used for medicinal purposes, make unsubstantiated claims to reduce harmful health effects associated with tobacco. Initially produced in China by the 1970s, more herbal-tobacco products have been produced by China in the late 1990s and Korea, Taiwan and Thailand since 2000. A few herb-only cigarettes suggest they help with smoking cessation. The increase in Asian herbal-tobacco cigarette production by 2000 coincides with the Asian tobacco companies' regular scientific meetings with TTCs and their interest in harm reduction.

Conclusion

The future market for Asian herbal-tobacco cigarettes may play a role in sustaining smoking acceptability in Asia. The World Health Organisation's Framework Convention on Tobacco Control, which all the Asian countries discussed here have ratified,⁹² does not specifically address harm reduced products. With the world's largest number of smokers, Asia faces additional challenges in tobacco control with these culturally concordant tobacco products that may discourage smokers from quitting.

ACKNOWLEDGEMENTS

We appreciate assistance with product identification by Jimmy Lee from IW Group, Dr. Alicia Fernandez from UC San Francisco, and Professor Tao Ming from Shanghai's Fudan University.

Authors' affiliations

Aiyin Chen, Stanton Glantz, Centre for Tobacco Control Research and Education, University of California, San Francisco, San Francisco, California, USA

Elisa Tong, Division of General Internal Medicine, University of California, Davis, Sacramento, California, USA

Funding: This work was funded in part by the University of California San Francisco Summer Medical Student Scholar Program, the American Heart Association, National Institutes of Health Fogarty grant TW05938 and National Cancer Institute Grant CA-87472.

Competing Interests: None.

REFERENCES

- Jha P, Ranson MK, Nguyen SN, et al. Estimates of global and regional smoking prevalence in 1995, by age and sex. *Am J Public Health* 2002;**92**:1002-6.
- Yang G, Fan L, Tan J, et al. Smoking in China: findings of the 1996 National Prevalence Survey. *Jama* 1999;**282**:1247-53.
- Sato H. Policy and politics of smoking control in Japan. *Soc Sci Med* 1999;**49**:581-600.
- Kang HY, Kim HJ, Park TK, et al. Economic burden of smoking in Korea. *Tob Control* 2003;**12**:37-44.
- Wen CP, Cheng TY, Eriksen MP, et al. The impact of the cigarette market opening in Taiwan. *Tob Control* 2005;**14**:i4-9.
- Chantornvong S, McCargo D. Political economy of tobacco control in Thailand. *Tob Control* 2001;**10**:48-54.
- Chaloupka FJ LA. *US trade policy and cigarette smoking*, Research NBoE Working Paper No.5543., 1996.
- O'Sullivan B, Chapman S. Eyes on the prize: transnational tobacco companies in China 1976-1997. *Tob Control* 2000;**9**:292-302.
- Lee K, Gilmore AB, Collin J. Breaking and re-entering: British American Tobacco in China 1979-2000. *Tob Control*, 2004;**13**, ii88-95.
- Nestler G. Traditional Chinese medicine. *Med Clin North Am* 2002;**86**:63-73.
- Body&Soul Health Food shop. Product Information on Honeyrose 2004. www.worldwideshoppingmall.co.uk/body-soul/honeyrose-herbal-cigarette-special-mix.asp (Accessed August 9 2004).
- US Tobacco Journal. Marketing Executive Offering Smoker An Alternative Cigarette. 22 Mar 1979. Bates No. 950051849. <http://legacy.library.ucsf.edu/tid/rj74f00>.
- Stratton K SP, Wallace R, et al, eds. *Clearing the smoke. Committee to assess the science base for tobacco harm reduction*. Washington DC: National Academy Place, 2001.
- Robins R, ed. *The Seduction of Harm Reduction: Proceedings from the September 2004 Summit*, Sacramento, CA:Department of Health Services, 2005.
- Joseph AM, Hennrikus D, Thoele MJ, et al. Community tobacco control leaders' perceptions of harm reduction. *Tob Control* 2004;**13**:108-113.
- Warner KE, Martin EG. The US tobacco control community's view of the future of tobacco harm reduction. *Tob Control* 2003;**12**:383-90.
- Tong EK, Glantz SA. ARTIST (Asian regional tobacco industry scientist team): Philip Morris' attempt to exert a scientific and regulatory agenda on Asia. *Tob Control* 2004;**13**:ii118-ii124.
- Care Co. LTD. NosmoQ <http://my.ecplaza.net/3gcare/2.asp> (Accessed August 10 2004).
- Korean Association of Medical Journal Editors. KoreaMed www.koreamed.org (Accessed September 2006).
- lcox.com. [Anti-asthma cigarette] 2002. www.tobacco.icxo.com/htmlnews/2002/12/16/149200.html (Accessed June 29 2004).
- Xisoming L. Herbal Cigarettes in China: Not Quite Healthy, But. 11 Nov 1988. Bates No. 325304611-325304612. <http://bat.library.ucsf.edu/tid/dpj82a99>.
- Gengtao C. China Produces A "Medicinal" Cigarette. 14 May 1982. Bates No. 950059114/9115. <http://legacy.library.ucsf.edu/tid/kud74f00>.

- Tobacco Reporter. New cigarettes claim to have good effect on health. Oct 1984. Bates No. 2501665802. <http://legacy.library.ucsf.edu/tid/ksm49e00>.
- Scul R Reuters, South China Morning Post. Cigarettes 'promote health'. 29 Aug 1984. Bates No. 2021573042A. <http://legacy.library.ucsf.edu/tid/lki23e00>.
- Area of Philip Morris Central Files. Yomiuri Shimbun. China develops 'safe cigarette' reputed to have medicinal effect versus heart disease and high blood pressure. 27 Nov 1985. Bates No. 202225468/5471. <http://legacy.library.ucsf.edu/tid/okt58e00>.
- Brown and Williamson collection. Be healthy, smoke Chinese: treatment of cigarette dependency. 30 Aug 1984. Bates No. 690154570. <http://legacy.library.ucsf.edu/tid/vcp93f00>.
- TobaccoChina.com. Qingzhou cigarette factory develops health cigarettes. Etsong tobacco group news 2000. <http://www.tobaccochina.com/englishnew/content.aspx?id=2475> (Accessed June 2004).
- Guangming Daily. Company in Henan develops substitute for cigarette 2003. www.tobaccochina.com/englishnew/content.aspx?id=3371 (Accessed October 2004).
- Arvady M. Usa PM. Update: "Double Happiness," "Hongtashan" and Other Chinese Brands in the N. Y. Market. 7 Jun 1996. Bates No. 2071630602/0605. <http://legacy.library.ucsf.edu/tid/ion37d00>.
- Browner J. An Evaluation of Jin Jian, a Chinese Medicinal Cigarette/316. 24 Nov 1982. Bates No. 650328758/8765. <http://legacy.library.ucsf.edu/tid/txl00f00>.
- Tianjin Daily. Tianjin cigarette factory develops high-grade health-friendly cigarette 2002. www.tobaccochina.com/englishnew/content.aspx?id=822 (Accessed October 2004).
- Zhang M. Meeting Report General Information. 9 July 1997. Bates No. 2076950347/0361. <http://legacy.library.ucsf.edu/tid/cqe85e00>.
- Zhang Ming-Shen. [The health promoting effects of Chinese herbs in cigarettes (Translation)] 2004. <http://www.tobaccochina.com/tech/data/20041/c112110145.htm> (Accessed January 2005).
- TobaccoChina.com. "Puleye" preparation used as additive in cigarette making. China business 2001. <http://www.tobaccochina.com/englishnew/content.aspx?id=1958> (Accessed August 2004).
- TobaccoChina.com. Chinese tobacco manufacturer develops new medicinal cigarette product. hnby.com.cn 2004. <http://www.tobaccochina.com/englishnew/content.aspx?id=13386> (Accessed October 2004).
- TobaccoChina.com. [Wuyeshen's secret of harm reduction (translated)] 2004. http://www.tobaccochina.com/zt/jianhai/revolution_3/article4_1.htm (Accessed June 2004).
- Henan Tiansheng Technology Development Co. LTD. (Company website for Yixing) www.chinayixing.com/english.htm (Accessed June 2005).
- Hong Z. World Tobacco. China employs medicinal herb to reduce 'tar' deliveries. Mar 1987. Bates No. 2023132370/2371. <http://legacy.library.ucsf.edu/tid/ysj48e00>.
- Goldmount. (Goldmount products: Blue and GT) Goldmount Co. 2002. www.goldmount.co.kr/eng/ (Accessed July 2 2004).
- Damin-biotech Co. (Figo-Loess Cigarette) Damin-biotech Co. 2002. www.damin-biotech.com/eng/ (Accessed July 1 2004).
- Walk RA. "Korean Health Authority Approves Anti Smoking Cigarette". 19 Jun 2001. Bates No. 2067227350/2067227351. <http://legacy.library.ucsf.edu/tid/svu34a00>.
- Cheong Y. The Efficacy of Herbal Cigarettes (Kumyeoncho) and Nicotine Patches in Smoking Cessation. *J Korean Acad Fam Med* 2003;**24**:1003-1009.
- Kim Seung-hyun, Joo-yun H. Small firms seek out smokers. *JoongAng Daily*, 2004 July 20, 2004.
- Goodheart J, Wu L. "Herbal Cigarettes to Enter Taiwan Market in Summer". 23 Mar 1999. Bates No. 2064207466B/7467. <http://legacy.library.ucsf.edu/tid/lqy08c00>.
- Bhatisevi A. Higher nicotine warning ignored/ Herbal-flavoured smokes get nod. *Bangkok Post*, 2000 11/9/, 2000.
- Pravattiyagul O. Puff it better. *Bangkok Post*, 2000 11/13/, 2000.
- Han F HJ, Xu H. [Effects of some Chinese herbal medicine and green tea antagonizing mutagenesis caused by cigarette tar] [Article in Chinese]. *Zhonghua Yu Fang Yi Xue Za Zhi* 1997;**31**:71-4.
- Chung FL. The prevention of lung cancer induced by a tobacco-specific carcinogen in rodents by green and black Tea. *Proc Soc Exp Biol Med* 1999;**220**:244-8.
- Hakim IA HR, Chow HH, Dean M, et al. Effect of a 4-month Tea Intervention on Oxidative DNA Damage Among Heavy Smokers: Role of Glutathione S-transferase Genotypes. *Cancer Epidemiol Biomarkers Prev* 2004;**13**:242-9.
- Yan Y, Wang Y, Tan Q, et al. Efficacy of polyphenon E, red ginseng, and rapamycin on benzo(a)pyrene-induced lung tumorigenesis in A/J mice. *Neoplasia* 2006;**8**:52-8.
- Tobacco Reporter. Herbal Cigarettes: Blending Ancient Chinese Medicine. Mar 1991. Bates No. 950059110. <http://legacy.library.ucsf.edu/tid/jud74f00>.
- Fen J, Yu L. Morris AoP. [Beijing cigarette factory's letter to PM]. 1980. Bates No. 2001205625. <http://legacy.library.ucsf.edu/tid/wts68e00>.
- Qiu HG. Beijing CYH. Observation on treatment of chronic bronchitis with cigarette containing extratum of Chinese medicinal herbs and its influence to pulmonary functions. Aug 1980. Bates No. 2001205782/5783. <http://legacy.library.ucsf.edu/tid/sss68e00>.
- Rodman A Rjr, Smeeton BW, Lee CK, et al. Short-Term Bioassay. Ames Test on Smoke Condensate - a Summary: Part 2 (1983-1984), 8 Mar 1985 Bates No. 504147475/7487. <http://legacy.library.ucsf.edu/tid/pov58d00>.
- Yokota H Pm KK. Chinese Cigarettes. 27 Mar 1987. Bates No. 2021561019. <http://legacy.library.ucsf.edu/tid/jeq44e00>.

- 56 **Connell CT**, Smith JN, Will NL. Asia Region Cigarette Information Report China Market Sample Number 23. 4 Mar 1994. Bates No. 2055650002/0005. <http://legacy.library.ucsf.edu/tid/mri53a00>.
- 57 **Fenna RA**, Laffoon SW. Asia Region Cigarette Information Report. Aug 1992. Bates No. 2055167820/7971. <http://legacy.library.ucsf.edu/tid/nul82e00>.
- 58 **Smith JN**, Will NL. Asia Region Cigarette Information Report. Feb 1994. Bates No. 2050955674/5770. <http://legacy.library.ucsf.edu/tid/ikj42e00>.
- 59 **Smith JN**, Will NL. Asia Region Cigarette Information Report 940200. Feb 1994. Bates No. 2050810414/0509. <http://legacy.library.ucsf.edu/tid/jhi93e00>.
- 60 **Philip Morris**. 960000 New Product Launches and Line Extensions. 1 Jan 1996. Bates No. 2074580370/0574. <http://legacy.library.ucsf.edu/tid/bwn66c00>.
- 61 **Market Daily**. Jinsheng brand of cigarettes popular among Chinese consumers 2003. www.tobaccochina.com/englishnew/content.aspx?id=244 (Accessed October 2004).
- 62 **China Daily**. Nanchang cigarette factory sees growth in sales, profits and taxes 2003. www.globalink.org/10840.shtml (Accessed October 2004).
- 63 **TobaccoChina**. com. "Wuyeshen" Cigarette Rewarded for Less Harm Meizhou cigarette factory 2001. <http://www.tobaccochina.com/englishnew/content.aspx?id=47> (Accessed October 2004).
- 64 **TobaccoChina**. com. Chinese Cigarette Factory, Universities Develop Less Harmful Cigarette Product enorth.com.cn 2003. <http://www.tobaccochina.com/englishnew/content.aspx?id=6255> (Accessed January 2005).
- 65 **Xinhua News Agency**. Ulan Hot cigarette factory develops cigarette with Chinese medicine 2002. www.tobaccochina.com/englishnew/content.aspx?id=1041 (Accessed October 2004).
- 66 www.tob-business.com, Anti-mutation liquid used as additive in cigarette making. www.tob-bas.com.cn/eng/info/scripts/show_news.asp?File_URL=%5CENG%5CINFO%5CCONT (Accessed August 2004).
- 67 **Fell J KE**, Adelman D. *China: The Final Frontier*, Tobacco Industry Overview. Morgan Stanley; 2005 July.
- 68 **TobaccoChina**. com. Jinsheng Cigarette Sets Good Example for Tobacco Innovation 2003. www.tobaccochina.com/englishnew/content.aspx?id=208 (Accessed October 2004).
- 69 **Beijing Cigarette Factory**. Beijing Cigarette Factory-- A Rising Star of China Tobacco Industry in the 21st Century 2005. www.beijingtobacco.com.cn/english/overview.asp (Accessed September 2006).
- 70 **Tsuji Y**, Mainichi Shimbun. 'Zhongnanhai'—China's VIP brand. A cigarette that's good for your health?! Loosens phlegm. JTS taking note, conducting research. 20 Jun 1984. Bates No. 2021561704/1710. <http://legacy.library.ucsf.edu/tid/zpe58e00>.
- 71 **Phillip Morris-Japan**. Media Uproar over Chinese safe cigarette. 1985. Bates No. 2029129166/9168. <http://legacy.library.ucsf.edu/tid/qkc83e00>.
- 72 **Philip Morris-Japan**. Japan Cigarette Market Summary 1992. 1992. Bates No. 2057101039/1132. <http://legacy.library.ucsf.edu/tid/imp52e00>.
- 73 **Philip Morris Japan**. [Report of Brands sold in Japan]. Mar 1992. Bates No. 2076277519/7523. <http://legacy.library.ucsf.edu/tid/ffp77d00>.
- 74 **Philip Morris Japan**. [1992 Information summary chart on brands in Japan]. Mar 1993. Bates No. 2057901210/1325. <http://legacy.library.ucsf.edu/tid/vjy96e00>.
- 75 **Philip Morris-Japan**. [Market research report]. Oct 2000. Bates No. 2505614720/4729. <http://legacy.library.ucsf.edu/tid/nqo25c00>.
- 76 **TobaccoChina**. com. Zhongnanhai cigarette sells well in Japan 2000. <http://www.tobaccochina.com/englishnew/content.aspx?id=9434> (Accessed June 2004).
- 77 **Area of Richard Carchman**. Reporter T. Group Opposes Chinese 'Health Cigarettes'. Jun 1987. Bates No. 2023132373. <http://legacy.library.ucsf.edu/tid/atj48e00>.
- 78 **Jung JW**. [Figo-Selling in New York]. [*Korean Times*], 2003 January 18;Sect.A11..
- 79 **Dong-A Daily News**. [Figo brand sold n the US (translation from Korean)]. *Dong-A Daily News*, 2003 January 22;Sect.A3..
- 80 **Korea Daily**. [Blue]. 2002 December 5;Sect. A9..
- 81 **Goodheart J**. China Economic N, Esmerk. Taiwan: New Product for Cigarette Market, 23 Mar 1999. Bates No.2064207438C/7439. <http://legacy.library.ucsf.edu/tid/nqy08c00>.
- 82 **Tpage Global Co. Ltd**. Herbal Cigarettes <http://catalog.tpage.com/listCategoryLevel3.jsp?c=2135> and link <http://www.asiatobacco.ebigchina.com/> (Accessed July 1 2004).
- 83 **Iida K**, Proctor RN. Learning from Philip Morris: Japan Tobacco's strategies regarding evidence of tobacco health harms as revealed in internal documents from the American tobacco industry. *Lancet* 2004;**363**:1820–4.
- 84 **Assunta M**, Chapman S. A "clean cigarette" for a clean nation: a case study of Salem Pianissimo in Japan. *Tob Control* 2004;**13**:ii58–ii62.
- 85 **Caraballo RS**, Pederson LL, Gupta N. New tobacco products: do smokers like them? *Tob Control* 2006;**15**:39–44.
- 86 **Chan TY**. Anticholinergic poisoning due to Chinese herbal medicines. *Vet Hum Toxicol* 1995;**37**:156–7.
- 87 **Samenuk D**, Link MS, Homoud MK, *et al*. Adverse cardiovascular events temporally associated with ma huang, an herbal source of ephedrine. *Mayo Clin Proc* 2002;**77**:12–16.
- 88 **Liu C**, Douglas RM. Chinese Herbal Medicine in the treatment of acute respiratory tract infections: review of randomized and controlled clinical trials. *Clin Infect Dis* 1999;**28**:235–6.
- 89 **Sutton CD**, Robinson RG. The marketing of menthol cigarettes in the United States: populations, messages, and channels. *Nicotine Tob Res* 2004;**6**:S83–91.
- 90 **Cunningham, Walsh**. Kool: 330000–800000 A Retrospective View of Kool. Book I: The Text, 10 Nov 1980. Bates No.670917650/7794. <http://legacy.library.ucsf.edu/tid/aqy60f00>.
- 91 **Pollay RW**, Dewhirst T. The dark side of marketing seemingly "Light" cigarettes: successful images and failed fact. *Tob Control* 2002;**11**:118–31.
- 92 **World Health Organization**. Updated Status of the WHO Framework Convention on Tobacco Control 2006. <http://www.who.int/tobacco/framework/countrylist/en/> (Accessed January 2006).