

NOTE

Notes on the Distribution of *Anopheles (Anopheles) sinensis* Wiedemann (Diptera: Culicidae) in China and the Status of Some *Anopheles Hyrcanus* Group Type Specimens from China

Anopheles (Anopheles) sinensis Wiedemann is an important vector of malarial parasites in China and Korea (Liu et al. 1990, Wilkerson et al. 2003). It has a wide distribution in Asia, including Afghanistan, Cambodia, China (north and south parts, Hong Kong), Malaysia, India (Assam), Indonesia, Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima, Ryukyu Islands), Korea (Korean Peninsula, Cheju Do), Myanmar, Singapore, Taiwan, Thailand, Vietnam (Tanaka et al. 1979, Harrison and Scanlon 1975), and Nepal (Darsie and Pradhan 1990). Several sources were used to document the distribution record of *An. sinensis* in China. First, LMR examined about 400 pinned mosquito specimens in the collection of the Institute of Zoology Museum, Chinese Academy of Sciences, Beijing. These specimens are presently housed in more than 50 boxes (most of which are 29 × 21 × 5.5 cm in size). Based on these collections, about 27 localities (counties or towns) in 8 provinces and 1 city (Beijing) were confirmed for *An. sinensis* (Table 1). Secondly, more than a hundred specimens located in the National Museum of Natural History, Smithsonian Institution, and on loan from The Natural History Museum, London, identified as *An. sinensis* were examined and confirmed from three provinces: Guangdong (Guangzhou: Daling), Yunnan (Kaiyuan, Kunming); Jiangsu (Nanjing, Wuxi). Thirdly, specimens of *An. sinensis* deposited in the Department of Etiologic Biology, Second Military Medical University, Shanghai, China, which includes collections from Hainan (Sanya and Lingshui), Guangdong (Zhuhai) and Shanghai, were confirmed. Fourth, the Entomology Laboratory of the Jiangsu Institute of Parasitology has on-going col-

lections of *An. sinensis*, whose origin was Wuxi, Jiangsu. Lastly, Ma et al. (1998) conducted molecular analyses of Chinese mosquitoes and listed one city (Beijing) and 9 provinces (county or town in parenthesis) of China where they collected *An. sinensis*, namely, Fujian (Jianyang), Guizhou (Sinan), Hainan (Dengmai), Henan (Zhengzhou), Jiangsu (Wujing, Wuxi), Liaoning (Faku, Shenyang), Shandong (Jining), Shanxi (Danfeng), Sichuan (Pixian, Pujiang), and Yunnan (Simao). The above observations reflect a very extensive geographical distribution of *An. sinensis* in mainland China, and we report that it is now known to occur in 46 locations (counties or towns) of 16 provinces and 2 cities (Beijing and Shanghai) (Fig. 1).

According to Yang et al. (1991: 84), the holotypes, allotypes, and paratypes of the *Anopheles (Anopheles) changfus* Ma (1981: 65), *An. (Ano.) dazhaius* Ma (1981: 65–66), *An. (Ano.) heiheensis* Ma (1981: 66–67) and *An. (Ano.) xiaokuanus* Ma (1981: 67–68) are deposited in the Institute of Zoology Museum, Chinese Academy of Science. The type localities are Sichuan (Emai) and Sichuan (unknown town) of the first two species, respectively, and Heilongjiang (Aihui) for the last two species. During a visit (LMR) to the Institute of Zoology Museum in May 2004, the insect curators, Dr. Xiaolin Chen and Mr. Jian Yao, attempted to find the above types in the museum building but could not locate them. Dr. S. F. Ma, who described those four species, was also unable to give any additional information about the location of the specimens (Xiaolin Chen, personal communication). If these specimens prove to be non-extant, neotype designations will be necessary to ensure stability in the *Anopheles Hyrcanus* Group.

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Table 1. Collections of *Anopheles (Anopheles) sinensis* in the Institute of Zoology Museum, Chinese Academy of Sciences, Beijing, China.

Box No.	Mosquitoes	Location	Date
0269-14	135 ♀	Beijing: Beijing	4–28 June 1957
0269-8	12 ♀ 1 ♂	Beijing: Pinggu	23 June 1970
	12 ♀	Beijing: Daxing	12–14 August 1970
	13 ♀ 1 ♂	Beijing: Yianqing	24 June 1970
0013-5	5 ♀	Zhejiang: Hangzhou	12 July 1956
0013-6	4 ♀, 3 ♂	Zhejiang: Hangzhou	1–16 September 1956
0013-21	48 ♀, 7 ♂	Zhejiang: Hangzhou	21–30 June 1956
	9 ♀, 4 ♂	Zhejiang: Hangzhou	7–14 July 1956
0013-14	2 ♀	Zhejiang: Hangzhou	11, 15 June 1956
	1 ♀	Zhejiang: Hangzhou	22 August 1956
	2 ♀	Zhejiang: Hangzhou	4 September 1956
0013-7	1 ♀	Zhejiang: Hangzhou	8 July 1956
	1 ♂	Zhejiang: Hangzhou	2 September 1956
0013-12	1 ♀	Guangdong: Guangzhou	29 September 1957
	2 ♀	Guangdong: Guangzhou	5, 8 October 1957
0013-1	4 ♀	Guangdong: Guangzhou	24 June 1956
	2 ♀, 2 ♂	Guangdong: Guangzhou	22 June 1957
0013-10	7 ♀	Guangdong: Guangzhou	21–30 May 1957
0269-19	1 ♀	Heilongjiang: Tahe	1 August 1971
	2 ♀	Guangxi: Longrui (120 m elev.)	5 December 1986
	22 ♀	Guangxi: Xiashixiang, Pingxiang (270 m elev.)	12 December 1986
No label	4 ♀	Guangxi: Pingxiang (120–270 m elev.)	5, 11 December 1986
0212-23	9 ♀	Guangxi: Pingxiang (270 m elev.)	13 December 1986
No label	9 ♀	Henan: Funiu	16 September 1986
0269-13	3 ♀	Anhui: Fucunniufang	11 July 1985
	3 ♀	Anhui: Furen	11 July 1985
	1 ♀	Anhui: Furenfang	7 July 1985
	1 ♀	Anhui: Huangshan	24 June 1985
	2 ♀	Anhui: Shuifutian	11 July 1985
	1 ♀	Anhui: Huangshan	24 June 1985
0212-27	21 ♀	Yunnan: Luchunxian (950–1800 m elev.)	2 July 1985
No label	8 ♀	Yunnan: Luchunxian (950–1800 m elev.)	16 September 1986
0212-7	4 ♀	Yunan: Manushu, Mengla (700 m elev. 1)	20 August 1986
0212-5	5 ♀	Yunan: Honjangu, Jiangchengxian (950 m elev.)	15 September 1986
0212-2	3 ♀	Yunan: Gejiu (1800 m elev.)	3 August 1986
	1 ♀	Yunan: Jiangchengxian (950 m elev.)	31 July 1986
	3 ♀	Yunan: Wenshanzhen (1300–1350 m elev.)	16 September 1986
0212-1	2 ♀	Yunan: Luchunxian (1400 m elev.)	8 August 1986
	3 ♀	Yunan: Yuanyangxian (1600 m elev.)	6 August 1986
0212-8	3 ♀	Yunan: Mengla (850–900 m elev.)	28 August 1986
0212-4	4 ♀	Yunan: Jiangchengxian (950 m elev.)	15 August 1986
	2 ♀	Yunan: Luchunxian (1400 m elev.)	9 August 1986
0212-22	5 ♀	Xingjiang: Yili	7–17 August 1957

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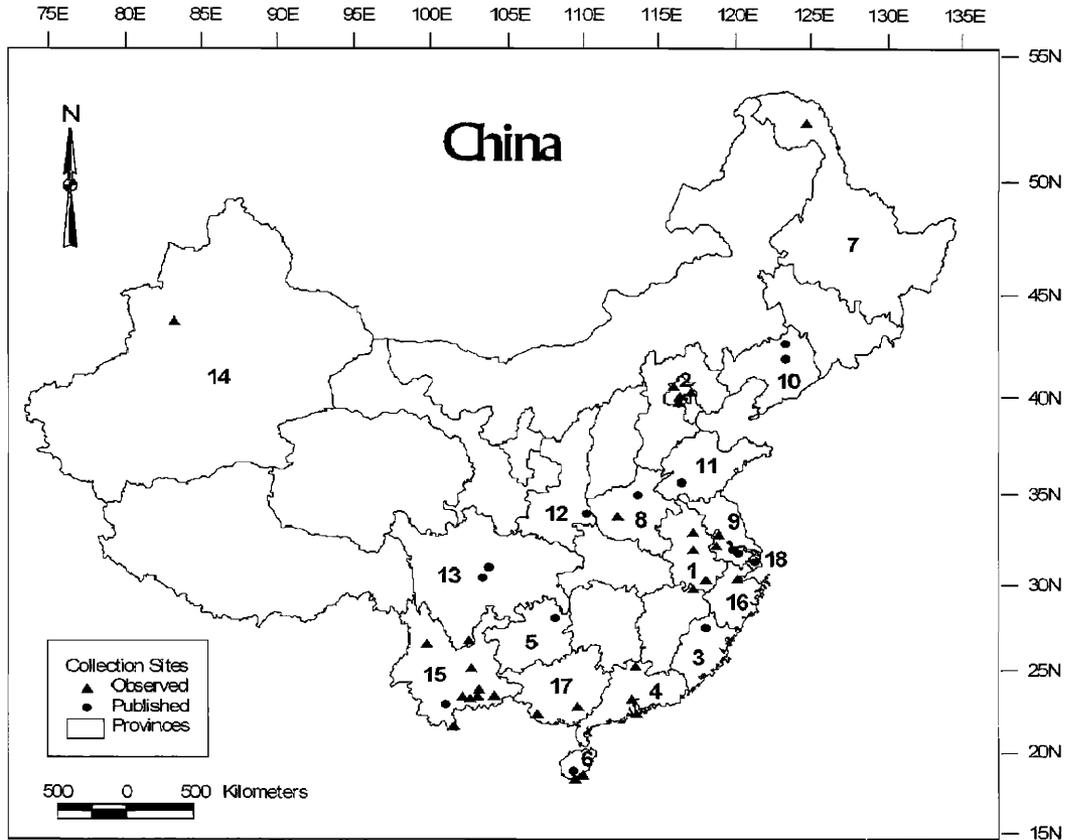


Fig. 1. Map of mainland China showing distribution of *Anopheles sinensis* (based on observed and published specimens).

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