

# Two Unreported Anopheline Mosquitoes in Korea

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韓國產 Anopheles 모기 未記錄種 二種에 관하여

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## 摘 要

韓國產 Anopheles 屬 모기는 4 種이 現在까지 報告 되었으나 1961 年 慶北 安東郡 禮安面에서 *A. lindesayi japonicus* 와 1964 年 全北 沃溝郡에서 처음 *A. yatsushiroensis* 를 發見함으로써 6 種의 Anopheles 屬 모기가 記錄되었다.

*A. lindesayi japonicus* 는 安東, 榮州와 京畿道 楊平에 分布되었으며 *A. yatsushiroensis* 는 全北의 沃溝, 金堤, 井邑, 忠南의 牙山, 京畿道 楊平, 高陽, 慶北의 榮州, 安東, 靑松等지에서 採集되는 廣範圍하게 分布되어 있는 一般의인 種類이다.

새로 報告되는 2 種의 成蟲안모기의 外部形態와 韓國產 Anopheles 의 檢索表를 記錄하였다.

## INTRODUCTION

Anopheles was first reported in Korea by Myatsuku (1901) and identified as *A. yesoensis*, which is collected from all over the country. Miyajima (1903) after having an extensive morphological study, identified *A. yesoensis* with *A. sinensis* Wiedemann, 1928.

In 1916 Watanabe found a new species of Anopheles from his collections in Pyongchang Gun, Kangwon Do and later Yamada and Watanabe (1918) named the species *A. koreicus* Yamada and Watanabe, 1918.

Furthermore, Yamada (1936) reported two unrecorded species, *A. koreicus edwardsi* collected in Daejon, Chungchong Namdo and *A. sineroides* Yamada, 1925 in Seoul and Daejon. Nakayama (1941) claimed that *A. k. edwardsi* was a form derived from *A. koreicus* under low temperatures and that the former should be treated as a synonym of the latter. This assertion was later supported by Miyakawa (1950) and Kaida (1951) (These mentioned above were quoted from the references of Yokoo

(1944, Miyazaki (1951) and Otsuru (1960).

In 1937 Yamada also discovered new species, collected from Daejon and Seoul vicinity and named *A. pullus* Yamada, 1937. At the present four species of anopheline mosquitoes mentioned above were reported in Korea.

Participating to carry out the mosquito survey for the malaria vector determination and their bionomics, as a part of the entomological activities of the malaria eradication programme, authors found two females of *A. lindesayi japonicus* Yamada, 1918 during the survey in Yean Myon, Andong Gun, Kyongsang Pukdo in May 1961 and one female in Kaegun Myon, Yangpyong Gun, Kyonggi Do in May 1962.

Meanwhile, authors have paid attention to the species of *A. lesteri*, a malaria vector in Far East Asia, which lays narrow-decked eggs. The species that has the narrow-decked egg was found in 1964 and was regarded as *A. lesteri*. However, after a careful study of adults, larvae and eggs, it was identified as *A. yatsushiroensis* Miyazaki, 1951 which was firstly reported in Japan in

1951. The specimens of *A. yatsushiroensis* (adult females, larvae and eggs) were sent to prof. M. Otsuru in Niigata University, Japan for the confirmation. Since it was believed that this species is widely distributed throughout the country, the collection of this species was made in Seoul, Asan Gun, Chungchong Namdo, Chungup Gun, Cholla Pukdo, and Andong Gun and Chongsong Gun of Kyongsang Pukdo

**MORPHOLOGICAL DESCRIPTION**

1. *Anopheles yatsushiroensis* Miyazaki (1951)

Adult female

Head: Palp dark brown, with scattered scales in the dark area of dorsal surface, with four white bands at the apex and succeeding three junction, distal three bands broad, apical white band frequently broad and continuing the third band, the second band broadest and fairly usefull in distinguishing at from other members of sinensis group.

Thorax: Scutum dark brown with yellowish brown to golden hair all over. Scutellum brown frosted, dark brown at the middle, and long and short bristles radiating backwards. Spiracular bristles yellowish brown, including 3-4 bristles average 3.1.

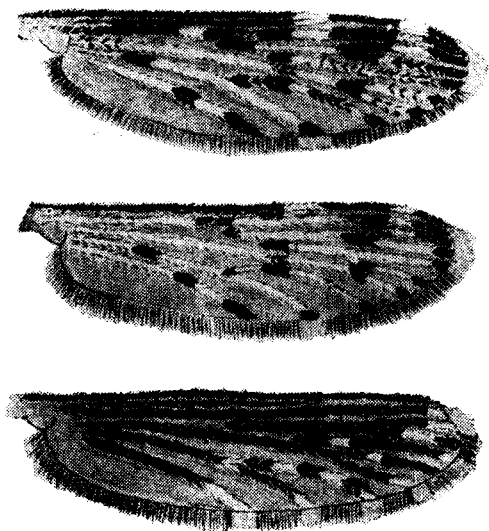


Fig. 1. Wings of *A. sinensis*, *A. lindesayi japonicus* and *A. yatsushiroensis*.

Wing: Vein c. almost dark except subcostal and preapical pale spots. Subcosta dark with many scattered pale scales, white scales forming a subcostal pale spot at

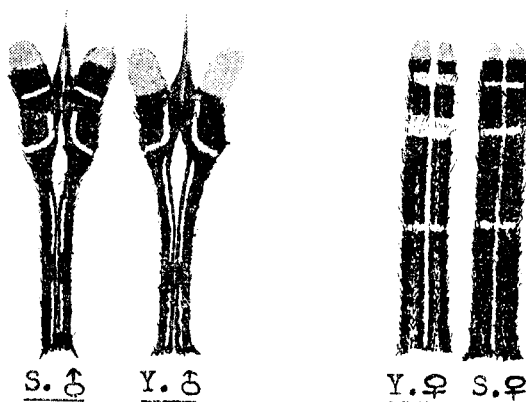


Fig. 2. Palpi of *A. sinensis* and *A. yatsushiroensis* (dorsal view).

the apex. Dark spots on the veins at following points: a. apical, preapical and middle dark spots of vein b. base of vein 2. c. base and apex of vein 2.1., vein 3., vein 4.1 and 4.2. d. middle of vein 5. e. three distinct dark spots at the base, the apex and the middle of vein 5.1. f. apex of vein 5.2. g. apex and middle of vein 6.

Leg: Each coxa and trochanter dark brown. Femore, tibiae and first tarsi dark brown exteriorly, yellowish brown interiorly, pale scales at the apices of femora and tibiae. Fore and midtarsi with pale band at the first, three junction. Hind tarsi with four pale bands at every junction.

2. *Anopheles lindesayi japonicus* Yamada (1958)

Adult female

Head: Torus dark brownish, without scales. Clypeus black. Flagellum dark scaled at base. Palpus dark scaled shorter than proboscis by labella of latter, or nearly as long. Proboscis dark, a little lighter at labella.

Thorax: Scutum with broad median area brownish frosted, covered with light brown hairs, densely beset with pale very narrow scales at anterior median end. Lateral margins of scutum greyish, with light brown hairs. The field between the lateral margins and the broad median area mentioned above is dark and covered with dark hairs. A longitudinally elongated black spot at posterior median end of prescuteller area.

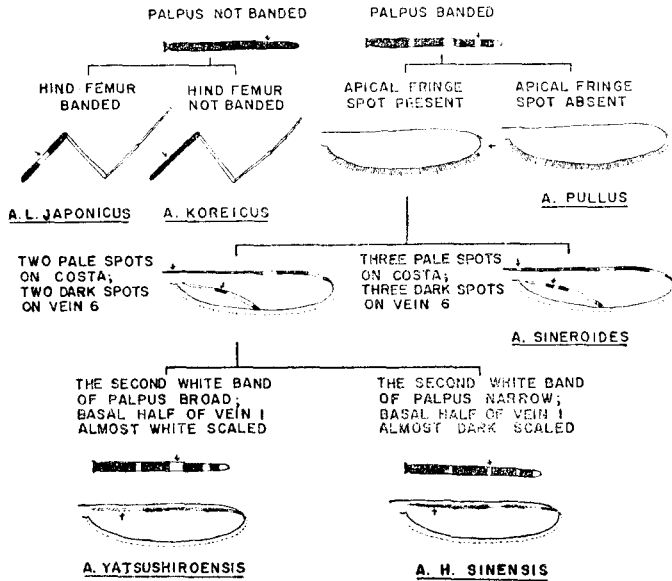
Wing: 4.2-5.4mm long on average. Black spot at proximal end of vein 3, and vein 2. Pale spots at following points: a. apex of vein 1. and vein 2.1. b. distal

to middle of vein 2.2. c. apex and near base of vein 3. d. near base of vein 4.1. e. apex of vein 4.2. f. base, apex and subapex of vein 5.1. g. base and apex of vein 5.2. h. apex of vein 6. halter knob dark.

Leg: Coxa of each leg pale greenish. Fore and mid

femora dark throughout except at base. Hind femur with pale band about 0.5mm broad distal to its middle, pale at base, especially on ventral side. Tibiae and tarsi all dark, haired all over. Second or third to sixth segments with faint band both dorsally and ventrally.

PICTORIAL KEY TO THE SPECIES OF ANOPHELINE MOSQUITOS IN KOREA



Key to the species of Korean anopheline mosquitoes

1. Palpus with white bands.....2  
Palpus without white bands.....5
2. Two white spots on costa vein; two dark spots on vein 6.....3  
Three white spots on costa vein; three dark spots on vein 6.....*sineroides*
3. Apical pale fringe spot of wing present.....4  
Apical pale fringe spot of wing absent.....*pullus*
4. The second white band of palpus broad; basal half of vein 1 almost white scaled...*yatsushiroensis*  
The second white band of palpus not broad; basal half of vein 1 almost dark scaled.....*sinensis*
5. Costa without white spot; hind femur with white broad band; tarsi entirely dark.....*japonicus*  
Costa with four white spots; hind femur

without white band; tarsi with pale bands...*koreicus*

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