NATURE AND LIFE

Vol. 10 No. 1 June 1980

Published by

The Kyungpook Society of Biological Sciences

c/o Department of Biology, College of Liberal Arts and Sciences
Kyungpook National University
Taegu 635, Korea

Nature & Life (*Kyungpook J. Biol. Scis.*) **10**(1) : 23—42. June, 1980
Printed in Korea

A Study on the Local Distribution of Planthoppers in Korea (Auchenorrhyncha, Delphacidae)*

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Abstract: The zoogeographical distribution of the Delphacidae in Korea is reviewed and arranged taxonomically. A total of 33 species belonging to 18 genera under 5 subfamilies are dealt with. All credible publicated informations, hitherto reported collection localities, and previously unreported collecting data are newly made respectively. Particularly host plants recorded from abroad and surveyed by the authors are added. Given are distribution maps to reveal the distribution trends in some species, and analysis of the pattern in view of zoogeography.

Introduction

The family Delphacidae is one of the large groups of the infraorder Fulgoromorpha Evans, 1949. Most species of the family are economically important pests on crops, by sucking juices and serving as vectors for some plant diseases. Particularly *Sogatella furcifera*, *Nilaparvata lugens* and *Laodelphax striatellus* are very desructive pests on the rice culture in Far East Asia including our country, with the transmissions of several plant viral diseases, for instances: black-streaked dwarf, northern cereal mosaic virus, or stripe. The first two pests, moreover, are known to immigrate into Korean Peninsula along with Japanse Archipelago in the beginning of every summer from southern part of China or Oriental Region, but the hibernation problem in Korea has neither been throughly surveyed to prove the immigration theory nor sufficient to reverse the hypothesis of overwintering.

It still remains much tasks to solve the above scenario and to support with the wide ranged investigations.

The aim of this work is arranging the local distribution of Delphacidae in Korea to offer the credible knowledge to the insect pest control with information of the management and analyzing population dynamics.

*This work was aided by a grant from The Korean Traders Scholarship Foundation (1979, 慶北大學校, No. 11 Z·B·Ⅱ·6·6)

Indeed, their classification as well as zoogeographical distribution were more or less obscure previously. In the present work, so far as possible, all available informations on the collection localities are arranged for each species. There remain still several species not as yet added to the local distribution. Thus in future, it must be added as the studies will progress continuously.

Up to now, total 33 species belonging to 18 genera under 5 subfamilies of delphacids are known to occur in Korea by the authors (1979).

The taxonomic arrangement of the genera in the present paper is based on the former system: as nearly a phylogenetic order as our present knowledge will permit. The species are listed alphabetically within each genus.

Before going further, the authors herewith express their hearty thanks to Prof. Dr. T. Ishihara, Ehime University, Japan, to Dr. O. Mochida, I.R.R.I., International Program in Indonesia, West Java, Indonesia, and to Dr. T. Okada, Chugoku National Agricultural Experiment Station, Japan, for their kindness. Special thanks are due to Mr. K. Yamagishi, Kyushu University, Japan, for obtaining the copies of literature and in various ways. They are also indepted to Mr. H. S. Lee, graduate school of our university, for collecting specimens.

Family **Delphacidae** Leach, 1815 멸구과

Subfamily 1. **Saccharosydninae** Vilbaste, 1968 풀멸구 아과

1. ***Saccharosydne procerus*** (Matsumura, 1910) 풀멸구
Dain. Gaich. Zensh. form. Ser.: 120 (*Oxycranus procerus*).

Localities: C. Korea—Gyeonggido Prov. (Okamoto, 1924), Mt. Soback (Lee & Kwon, 1977); S. Korea—Jeonlabukdo Prov. (Okamoto, 1924), Mt. Palgong (Lee & Kwon, 1977), Daegu (Lee & Kwon, 1977), Jikji Temple (1♂, 2♀♀, 24, VII, 1978, coll. Y. J. Kwon). **Distribution**: Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu, Ryukyu Is.), U. S. S. R. (Maritime Territory). **Hosts**: *Oryza sativa, Zizania latifolia.* This species is sometimes attracted to the light in summer nights.

Subfamily 2. **Stenocraninae** Wagner, 1963 고려멸구 아과

2. ***Stenocranus hokkaidoensis*** Metcalf, 1943 북해도멸구
Gen. Cat. Hem 4(3) : 168.

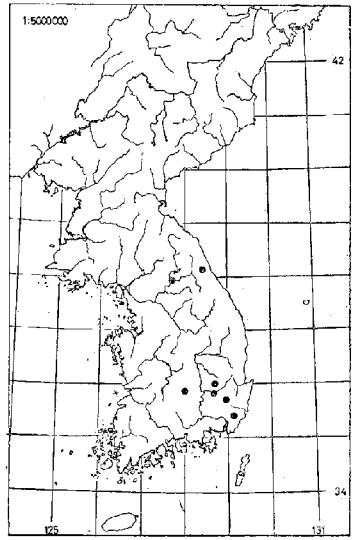
Locality: C. Korea—Mt. Suyang (Doi, 1936).
Distribution: Korea, Japan(Hokkaido, Kyushu), U. S. S. R. (Maritime Territory).
Host: unknown.

3. ***Stenocranus koreanus*** Matsumura, 1935 고려멸구
Ins. Mats. 9 : 129.

Locality: C. Korea—Suweon(Matsumura, 1935). **Distribution**: Korea. **Host**: unknown.

4. ***Stenocranus matsumurai*** Metcalf, 1943 일본멸구
Gen. Cat. Hem. 4(3) : 172.

Localities: C. Korea—Mt. Seolak(Lee & Kwon, 1977), Mt. Obong(Lee & Kwon, 1977); S. Korea—Mt. Unmun (Lee & Kwon, 1977), Daegu (Lee & Kwon, 1977), Mt. Sudo (2♂♂, 4♀♀, 28, VII, 1979, coll. H. S. Lee), Mt. Palgong (4♂♂, 7♀♀, 4, V, 1980, coll. Y. J. Kwon), Naeweonsa Valley (2♂♂, 1♀, 30, V, 1980, coll. Y. J. Kwon).
Distribution: Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu). **Hosts**: *Equisetum arvense, Phalaris arundinacea, Phragmites communis, Miscanthus sinensis, Hordeum vulgare.*



Map 1. Distribution of *Stenocranus matsumurai.*

5. ***Stenocranus takasagonis*** Matsumura, 1935 해동멸구
Ins. Mats. 10··72.

Locality: unknown. **Distribution**: Korea, Japan(Honshu, Kyushu). **Host**: unknown.

6. ***Stenocranus yasumatsui*** Ishihara, 1952 야스마쓰멸구
Mushi 24(2) : 5—6, pl. 1.

Locality: unknown. **Distribution**: Korea, Japan (Honshu, Shikoku, Kyushu). **Host**: *Carex* sp.

7. ***Terauchana nigripennis*** Kato, 1933 월악산멸구
Ent. World 1 : 470, pl. 14(12).

Locality: C. Korea—Mt. Weolak(Lee & Kwon, 1979). **Distribution**: Korea, Japan (Honshu, Kyushu). **Hosts**: *Imperata cylindrica* var. *koenigii.*

8. ***Terauchiana singularis*** Matsumura, 1915 금강산멸구

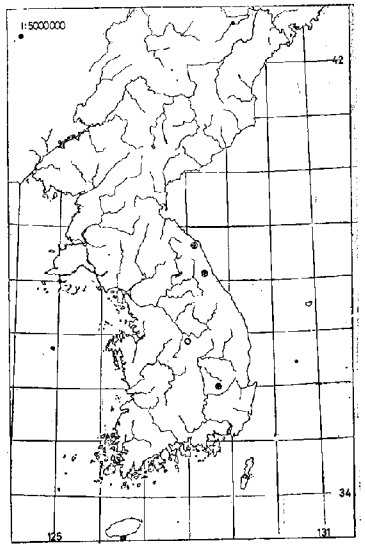
Trans. Sapporo Nat. Hist. Soc. 5 : 158, 177, 184, pl. 1(1).

Localities: C. Korea—Mt. Geumgang (Matsumura, 1915), Mt. Seolak (Lee & Kwon, 1977); S. Korea—Mt. Palgong (Lee & Kwon, 1977). **Distribution**: Korea, Japan (Honshu, Kyushu), U. S. S. R. (Maritime Territory). **Hosts**: *Imperata cylindrica* var. *koenigii, Miscanthus sinensis, Phragmites communis, Poa annua, Onoclea sensibilis.*

Subfamily 3. ***Tropidocephalinae*** Muir, 1915 영남멸구 아과

9. ***Tropidocephala brunnipennis*** Signoret, 1860 영남멸구

Ann. Soc. Ent. France 8 : 185, pl. 5(2).



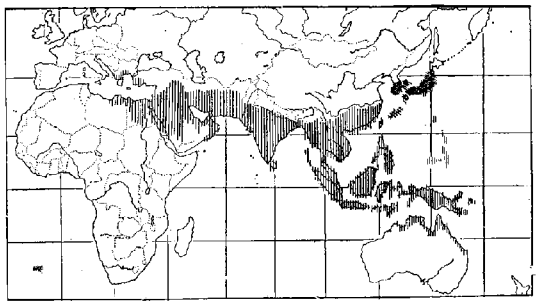
Map 2. Distribution of the genus *Terauchiana*. ◎: *T. nigripennis*, ●: *T. singularis*.

Localities: S. Korea— Mt. Palgong (Lee & Kwon, 1977), Whasan (Lee & Kwon, 1977), Daegu (Lee & Kwon, 1977), Yeosu (Lee & Kwon, 1977), Mt. Jiri (Lee & Kwon, 1977), Ulneung Is. (22♂♂, 3♀♀, 3, VIII, 1977, coll. Y. J. Kwon), Hong Is. (4♂♂, 11♀♀, 13, VIII, 1977, coll. Y. J. Kwon), Heuksan Is. (3♂♂, 2♀♀, 15, VIII, 1977, coll. Y. J. Kwon), Bogyeong Temple (2♀♀, 15, X, 1977, coll. Y. J. Kwon), Jikji Temple (2♂♂, 1♀, 24, VII, 1978, coll. Y. J. Kwon), Tongdo Temple (2♂♂, 5♀♀, 9, X, 1979, coll. Y. J. Kwon), Naeweonsa Valley (2♂♂, 3♀♀, 30, V, 1980, coll. Y. J. Kwon), Mt. Geumjeong(♂, 1. VI, 1980, coll. Y. J. Kwon), Yongmun Temple, Namhae Is. (4♂♂, 7♀♀, 15, VI, 1980, coll. Y. J. Kwon); Jeju Is.—Hagui (Lee & Kwon, 1977), Seoguipo (1♂, 17, XII, 1979, coll. Y. J. Kwon). **Distribution**: Korea, Japan (Honshu, Shikoku, Kyushu, Ryukyu Is.), Taiwan, China, Australia, Madagascar, Egypt, N. Africa, S. Europe. **Hosts**: *Oryza salivia, Imperata cylindrica* var. *koenigii, Miscanthus sinensis, Saccharum officinarum.*

10. ***Tropidocephala nigra*** (Matsumura, 1900) 먹멸구

Ent. Nachr. 26 : 261(*Conicoda nigra*).

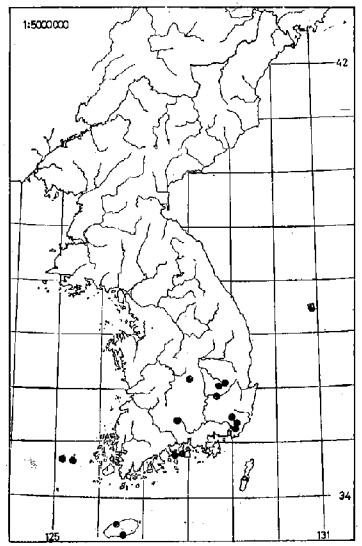
Localities: S. Korea—Daegu (Lee & Kwon, 1977), Ulneung Is. (1♀, 3, VIII, 1977, coll. Y. J. Kwon), Heuksan Is. (2♂♂, 4♀♀, 15, VIII, 1977, coll. Y. J. Kwon), Hong Is. (2♂♂, 3♀♀, 13, VIII, 1977, coll. Y. J. Kwon), Mt. Geumjeong (1♂, 1, VI, 1980, coll, Y. J. Kwon), Yongmun Temple, Namhae Is. (2♂♂, 1♀, 15, VI, 1980, coll, Y. J. Kwon); Jeju Is.—Jocheon (Lee & Kwon, 1977), Hagui (Lee & Kwon, 1977), **Distribution**: Korea, Japan (Honshu, Shikoku, Kyushu, Ryukyu Is.). **Hosts**: *Miscanthus sinensis, Imperata cylindrica* var. *koenigii.*

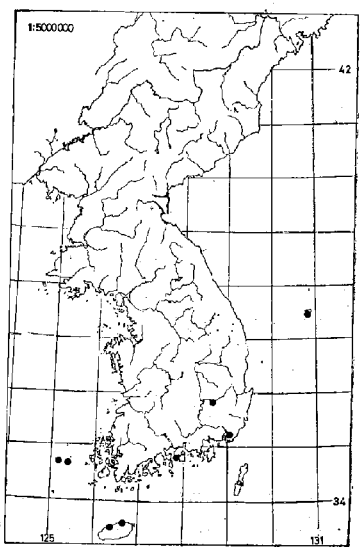


Map 3. Distribution trends in the members of the genus *Tropidocephala*. Vertical shaded area represents *T. brunnipennis*, inclined shaded area represents *T. nigra*.

Map 4. Distribution of *Tropidocephala brunnipennis*.

Map 5. Distribution of *Tropidopcephala nigra*.

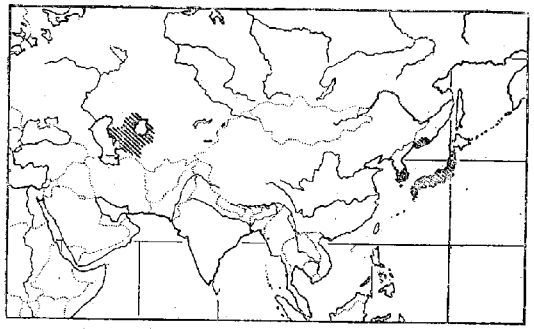




Subfamily 4. **Chlorioninae** Wagner, 1963 무주멸구 아과

11. *Chloriona tateyamana* Matsumura, 1935 무주멸구
Ins. Mats. 9 : 138.

Localities: C. Korea—Mt. Sobaek(Lee & Kwon, 1977) ; S. Korea—Mt. Deogyu (Lee & Kwon, 1977). **Distribution**: Korea, Japan(Honshu, Kyushu), U. S. S. R. (Maritime Territory) **Hosts**: *Phragmites communis, Phragmites japonica, Typha laxmanni.*



Map 6. Distribution of *Chloriona tateyamana.*

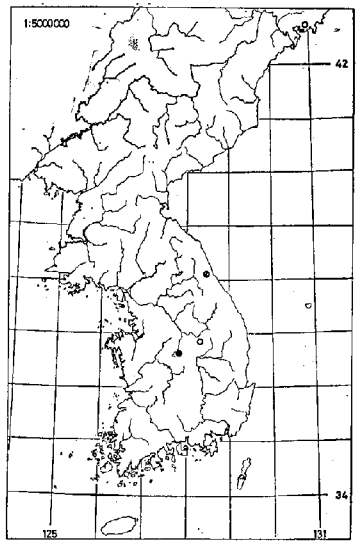
Subfamily 5. **Crimorphinae** Kirkaldy, 1910 멸구 아과

12. *Kakuna kuwayamai* Matsumura, 1935 설악멸구
Ins. Mats. 10 : 76.

Localities: C. Korea—Mt. Seolak (Lee & Kwon, 1977) ; S. Korea—Mt. Sokni (1♂, 10, Ⅷ, 1979, coll. H. S. Lee). **Distribution**: Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu). **Host**: *Phragmites communis.*

13. *Kakuna velitchkovskyi* (Melichar, 1913) 북방멸구
Faun. Walouyk. Russ. 7 : 6, 10 (*Euidella velitchkovskyi*).

Locality: C. Korea—Mt. Sobaek(Lee & Kwon, 1979). **Distribution**: Korea,



Map 7. Distribution of the genus *Kakuna.*
●: *K. kuwayamai,*
◎: *K. velitchkovskyi.*

Japan(Hokkaido, Honshu, Kyushu), U. S. S. R. (Maritime Territory). **Host**: *Typha laxmani.*

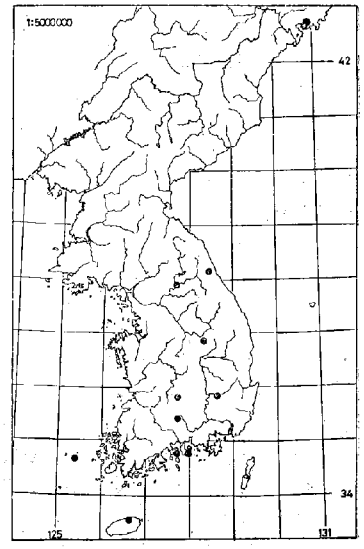
14. *Unkanodes sapporona* (Matsumura, 1935) 운계멸구
Ins. Mats. 10 : 74 (*Unkana sapporona*).

Localities: C. Korea—Mt. Seolak(Lee & Kwon, 1977), Mt. Obong(Lee & Kwon 1977), Mt. Sobaek(Lee & Kwon, 1977) ; S. Korea—Daegu(Lee & Kwon, 1977), Ycosu (Lee & Kwon, 1977), Mt. Jiri(Lee & Kwon, 1977), Mt. Deogyu(Lee & Kwon, 1977), Heuksan Is. (1♂, 1♀, 15, Ⅷ, 1977, coll. Y. J. Kwon); Jeju Is.—Manjanggul(Lee & Kwon, 1977), Mt. Geum, Namhae Is. (1♂, 1♀, 15, Ⅶ, 1980, coll. Y. J. Kwon). **Distribution**: Korea, Japan(Hokkaido, Honshu, Kyushu), U. S. S. R. (Maritime Territory), China(Shansi), Taiwan, India. **Hosts**: *Arundinella hirta, Imperata cylindrica* var. *koenigii, Ischaemum anthephoroides, Miscanthus sinensis.*

Recently this species was reported to attack rice in India (Kulshreshtha et al, 1970).

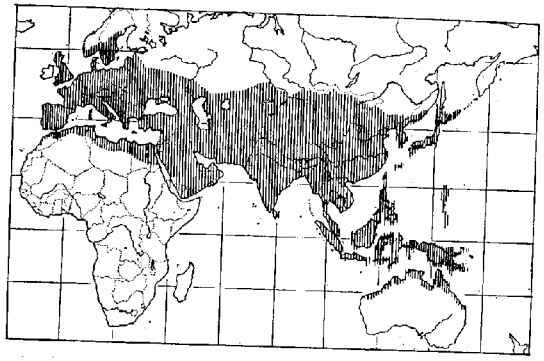
15. *Laodelphax striatellus* (Fallén, 1826) 애멸구
Hem. Svec. Cicad. : 75 (*Delphax striatella*)

Localities: whole Korea, the following records were reported in the faunistic literatures previously; N. Korea—Pyeongannamdo Prov. (Okamoto, 1924), Hamgyeongnamdo Prov. (Okamoto, 1924) ; C. Korea—Gyeonggido Prov. (Okamoto, 1924), Chungcheongbugdo Prov. (Okamoto, 1924), Chungcheongnamdo Prov. (Okamoto, 1924), Mt. Seolak (Lee & Kwon, 1977), Mt. Obong(Lee & Kwon, 1977) ; S. Korea—Gyeongsangbugdo Prov. (Okamoto, 1924), Jeonlabugdo Prov. (Okamoto, 1924), Mt. Palgong(Lee & Kwon, 1977), Daegu(Lee & Kwon, 1977), Banyaweol(Lee & Kwon, 1977), Suncheon (Lee & Kwon, 1977), Haein Temple (Lee & Kwon, 1977), Whasan(Lee & Kwon, 1977), Yeosu(Lee & Kwon, 1977) Samsan(Lee & Kwon, 1977), Mt. Deogyu (Lee & Kwon, 1977), Ulneung Is. (1♂,



Map 8. Distribution of *Unkanodes sapporona.*

3, Ⅷ, 1977, coll. Y. J. Kwon), Heuksan Is. (3♂♂, 1♀, 1977, coll. Y. J. Kwon), Tongdo Temple(4♂♂, 3♀♀, 2, Ⅸ, 1979, coll. Y. J. Kwon), Mt. Geum, Namhae Is. (3♂♂, 1♀, 14, 1980, coll. Y. J. Kwon); Jeju Is.—Seoguipo(4♂♂, 3♀♀, 17, Ⅲ, 1979, coll. Y. J. Kwon).



Map. 9 Distribution trends of *Laodelphax striatellus*.

Distribution: Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu, Ryukyu Is.), U. S. S. R. (Maritime Territory Kuril Is., Altai Mts., Armenia, Azerbaijan, Estonia, Gorgia, Kazakhstan, Kirghizia, Lativa, Moldavia, Russia, W. Siberia, Tadzhikistan, Ukraine, Uzbekistan), China(Manchuria, Shansi), Afghanistan, Albania, Algeria, Austria, Bulgaria, Canary Is., Czechoslovakia, Finland, France, German, England, Hungary, Iran, Iraq, Israel, Italy, Lebanon, Madeira Archipelago, Mongolia, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Tunisia, Turkey, Yugoslavia, Taiwan, Micronesia.

Hosts: *Oryza sativa, Hordeum vulgare, Agropyron tsukushiense* var. *transiense, Agrostic clavata* var. *nukabo, Alopecurus aequalis* var. *amurensis, Digitaria adscendens, Digitaria violascens, Echinochloa crus-galli*, var. *crus-galli, Echinochloa crus-galli* var. *frumentacea, Echinochloa crus-galli* var. *oryzicola, Lolium multiflorum, Panicum miliaceum, Pennisetum alopecuroides, Phalaris arundinacea, Phleum paniculatum, Poa annua, Saccharum officinarum, Setaria glauca, Setaria italica, Setaria viridis, Sorghum vulgare, Triticum aestivum, Beckmannia syzigachne, Coix lacrymajobi, Zea mays, Zizania latifolia, Medicago sativa, Trifolium* spp., *Miscanthus sinensis.*

16. *Sogatella furcifera* (Horváth, 1899) 흰등멸구

Termesz. Füz. 22 : 372 (*Delphax furcifera*)

Localities: whole Korea with recorded as, N. Korea—Hamgyeongbugdo Prov. (Odamoto, 1924), Hamgyeongnamdo Prov. (Okamoto, 1924), Pyeonganbugdo Prov. (Okamoto, 1924), Pyeongannamdo Prov. (Okamoto, 1924) ; C. Korea—Gangweondo Prov. (Okamoto, 1924), Whanghaedo Prov. (Oakmoto, 1924), Gyeonggido Prov. (Okamoto, 1924), Chungcheongbudgo Prov. (Okamoto, 1924), Chungcheongnamdo Prov. (Okamoto, 1924), Seoul(Lee & al, 1976), Mt. Hyangrobong(Kim & al, 1975), Bangsan-myeon(Kim & al, 1975) ; S. Korea—Gyeongsangbugdo Prov. (Okamoto, 1924), Gyeongsangnamdo Prov. (Okamoto, 1924), Mogpo(Kamijo, 1936), Daegu(Lee & Kwon, 1977), Banyaweol(Lee & Kwon, 1977), Mt. Deogyu(Lee & Kwon, 1977), Heugsan(2♂♂, 15, 1977, coll. Y. J. Kwon), Tongdo Temple(4♂♂, 2♀♀, 2, Ⅸ, 1979, coll. Y. J. Kwon), Gacheon-ri, Samnam-myeon(3♂♂, 2♀♀, 28, Ⅴ, 1980, coll. Y. J. Kwon).

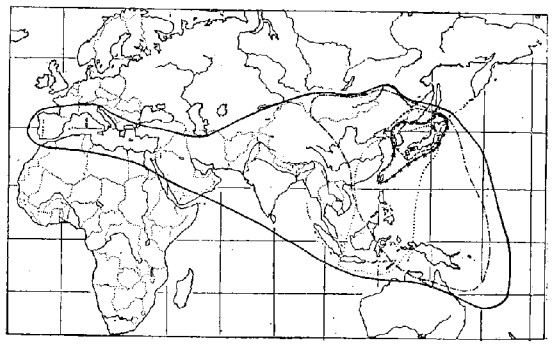
Distribution: Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu, Ryukyu Is.), China (Manchuria, Shansi), U. S. S. R. (Maritime Territory, Kuril Is.), Mongolia, Taiwan, Madeira Archipelago, Canary is., Egypt, Italy, Micronesia, Australia, Ceylon.

Hosts: *Oryza sativa, Carex fermaldiana, Cyperus microiria, Cyperus rutundus, Agropyron tsukushiense* var. *transiens, Agrostis flaccida, Alopecurus aequalis* var. *amurensis, Beckmannia syzigachne, Digitaria adscendens, Digitaria violescens, Echinochloa colonum, Echinochloa crus-galli* var. *crus-galli, Echnochloa crus-galli* var. *oryzicola, Eleusine coracana, Eleusine indica, Eragrostis ferruginea, Hemarthria sibirica, Isachne globosa, Leersia hexandra, Leersia japonica, Leersia sajanuka, Miscanthus siensis, Paspalum thunbergii, Pennisetum alopecuroides, Phalaris arudinacea, Poa acroleuca, Poa annua, Poa nipponica, Saccharum officinarum, Setaria glauca, Setaria, italica, Setaria viridis, Setaria viridis* var. *pachystachys, Sorghum vulgare, Spodiopogon depauperatus, Sporobolus indicus, Triticum aestivum, Zea mays, Zizania latifolia, Hordeum vulgare.*

It seems that this species does not hibernate in Korean Penisula indeed, but immigrates into the country in early summer by the wind from southern parts of China where the population of the species propagates in the mild weather, as explicated by Kisimoto (1975).

This time(May, 28th, 1980), we discovered 3 males and 2 females on the shoots of rice(Milyang-23) at paddy field which located 375, Gacheon-ri, Samnam-myeon, Ulju County, Gyeongsangnamdo Prov. (cultivator: Chun Jo Park, 43-age). And the above appearance seems to be the first record of attacking the shoots of rice,

in this year, from Korean Peninsula. It is noteworthy that all the specimens are obviously, macropterous as in case of immigrant forms of other years.



Map 10. Distribution trends in the members of the genus *Sogatella*.
——— : *S. furcifera*, —·—·— : *S. longifurcifera*,
— — — : *S. panicicola*, —×—×— : *S. sirokata*,
····· : *S. terryi*.

17. *Sogatella longifurcifera* (Esaki et Ishihara, 1947) 흰등멸구붙이

Mushi 17 : 41 (*Delphacodes longifurcifera*).

Localities: C. Korea—Mt. Odae(Kim & Kim, 1971); S. Korea—Uleung Is.(1♂, 3, Ⅷ, 1977, coll. Y. J. Kwon), Heuksan Is.(2♂♂, 1♀, 15, Ⅷ, 1977, coll. Y. J. Kwon), Jikji Temple(1♂, 3♀♀, 24, Ⅶ, 1978, coll. Y. J. Kwon), Mt. Palgong(2♂♂, 3♀♀, 1, Ⅹ, 1978, coll. Y. J. Kwon), Tongdo Temple(4♂♂, 5♀♀, 9, Ⅹ, 1979, coll. Y. J. Kwon); Jeju Is.—Seoguipo(1♂, 4♀♀, 17, Ⅶ, 1979, coll. Y. J. Kwon).
Distribution: Korea, Japan(Hokkaido, Honshu, Kyushu), U. S. S. R. (Maritime Territory), Mongolia, Taiwan, Micronesia, Australia.
Hosts: *Oryza sativa, Digitaria adscendens, Echinochloa crus-galli* var. *crus-galli, Echinichloa crus-galli* var. *oryzicola, Leersia sayanuka, Phalaris arundinacea, Poa annua, Setaria italica, Zea mays.*

18. *Sogatella panicicola* (Ishihara, 1949) 피멸구

Sci. Rep. Matsuyama Agr. Coll. 2 : 51—52 (*Delphacodes panicicola*).

Localities: C. Korea—Mt. Obong(Lee & Kwon, 1977); S. Korea—Daegu(Lee & Kwon, 1977), Banyaweol(Lee & Kwon, 1977), Whasan(Lee & Kwon, 1977), Haein Temple(Lee & Kwon, 1977), Mt. Deogyu(Lee & Kwon, 1977).
Distribution: Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu), U. S. S. R. (Maritime Territory). **Hosts**: *Oryza sativa, Echinochloa crus-galli* var. *crus-galli, Echinochloa crus-galli* var. *frumentacea.*

19. *Sogatella sirokata* (Matsumura et Ishihara, 1945) 어리흰등멸구

Mushi 16 : 64 (*Sogata sirokata*).

Locality: unknown. **Distribution**: Korea, Japan(Hokkaido, Honshu, Kyushu), Taiwan. **Hosts**: *Oryza sativa, Echnochloa crus-galli* var. *crus-galli, Echinochloa crus-galli* var. *oryzicola, Phragmites communis, Polygonum thunbergii.*

20. *Sogatella terryi* (Muir, 1917) 베리멸구

Proc. Haw. Ent. Soc. 3 : 334, pl. 5(23) (*Delphacodes terryi*).

Locality: unknown. **Distribution**: Korea, Japan(Honshu, Kyushu, Ryukyu Is.), Taiwan, S. China, Java. **Hosts**: *Oryza sativa, Miscanthus sinensis, Panicum repens.*

21. *Nilaparvata bakeri* (Muir, 1971). 벼멸구붙이

Proc. Haw. Ent. Soc. 3 : 336, pl. 4(17) (*Delphacodes bakeri*).

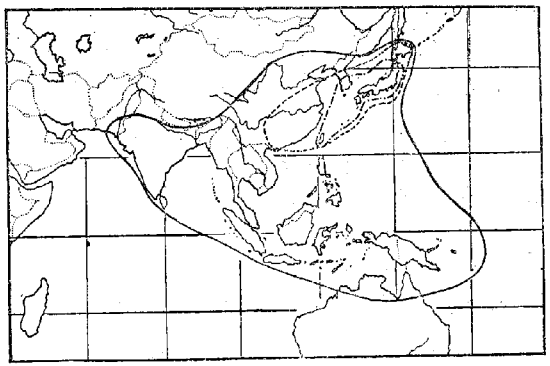
Localities: C. Korea—Mt. Obong(Lee & Kwon, 1977), Mt. Sobaek(Lee & Kwon, 1977); S. Korea—Daegu(Lee & Kwon, 1977), Haein Temple(Lee & Kwon, 1977); Jeju Is.—Manjanggul(Lee & Kwon, 1977). **Distribution**: Korea, Japan(Honshu, Shikoku, Kyushu), Taiwan. **Hosts**: *Oryza sativa, Arthraxon hispidus, Digitaria adscendens, Echinochloa crus-galli* var. *crus-galli, Echinochloa crus-galli* var. *oryzicola, Isachne globosa, Leersia japonica, Leersia sayanuka, Poa annua.*

22. *Nilaparvata lugens* (Stål, 1854). 벼멸구

Oefv. Ak. Forth. 11 : 246 (*Delphax lugens*).

Localities: whole Korea; recorded as, N. Korea—Hamgyeongnamdo Prov. (Okamoto, 1924), Pyeongganbugdo Prov. (Okamoto, 1924), Pyeongannamdo Prov. (Okamoto, 1914); C. Korea—Whanghaedo Prov. (Okamoto, 1924), Gyeonggido Prov. (Okamoto, 1924), Chungcheongbugdo Prov. (Okamoto, 1924), Chungcheongnamdo Prov. (Okamoto, 1924), Seoul(Doi, 1936); S. Korea—Gyeongsangbugdo Prov. (Okamoto, 1924), Gyeongsangnamdo Prov. (Okamoto, 1924), Jeonlabugdo Prov. (Okamoto,

1924), Jeonlanamdo Prov. (Okamoto, 1924), Mt. Juwang(Lee & Kwon, 1977), Daegu(Lee & Kwon, 1977), Whasan(Lee & Kwon, 1977), Mt. Deogyu(Lee & Kwon, 1977), Tongdo Temple(1♂, 9, Ⅸ, 1979, coll. Y. J. Kwon). **Distribution:** Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu, Ryukyu Is., Yaku Shima,



Map 11. Distribution trends in the members of the genus *Nilaparvata*.
—·—·— : *N. bakeri*, ——— : *N. lugens*,
— — — : *N. muiri*.

Tanega Shima), China(Manchuria), Taiwan, India, Australia, Micronesia, New Guinea. **Hosts:** *Oryza sativa, Stellaria alsine* var. *undulata, Commelina communis, Carex thunbergii, Carex* sp., *Cyeprus rotundus, Agrohyron tsukushiense* var. *transiens, Agrostis clavata, Alopecurus aequalis* var. *amurensis, Arthraxon hispidus, Cynodon dactylon, Digitariaria adscendens, Echinochloa crus-galli, Eleusine coracana, Eleusine indica, Glyceria acutiflora, Glyceria depauperata, Leersia hexandra, Leersia sayanuka, Poa acroleuca, Poa annua, Poa nopponica, Poa sphondylodes, Saccharum officinarum, Zea mays, Zizania latifolia.*

As in case of *Sogatella furcifera* (Horváth, 1899), the preceding species also immigrates into Korean Peninsula from China or Oriental Region in the every summer, and most propagates at rice paddy.

23. *Nilaparvata muiri* China, 1925 이삭멸구
Ann. Mag. Nat. Hist. 16 : 480.

Locality: S. Korea—Tongdo Temple(brachypterous 1♂, macropterous 1♀, 2, Ⅸ, 1979, coll. Y. J. Kwon), Gacheon-ri, Samnam-myeon(macropterous 1♂, 28, Ⅴ, 1980, coll. Y. J. Kwon). **Distribution:** Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu), S. China. **Hosts:** *Oryza sativa, Digitaria adscendens, Echinochloa*

crus-galli var. *crus-galli, Echinochloa crus-galli* var. *oryzicola, Isachne globosa, Leersia japonica, Leersia sayanuka, Phalaris arundinacea.*

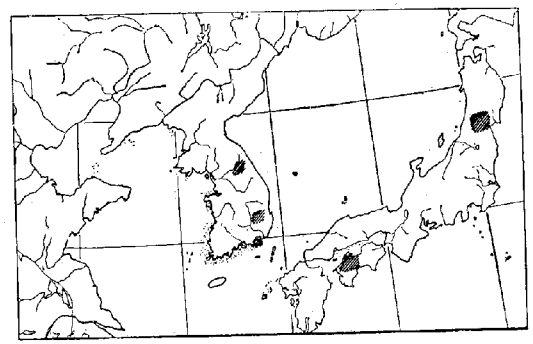
This species was also collected on the shoots of rice(Milyang-15) at paddy field, along with previously described *Sogatella furcifera.* And the above discovery is the first record of attacking the shoots of rice, in this year from Korea.

24. *Muirodelphax matsuyamensis* (Ishihara, 1952) 월동멸구
Sci. Rep. Matsuyama Agr. Coll. 8 : 44 (*Delphacodes matsuyamensis*),

Localitis: C. Korea—Mt. Obong(Lee & Kwon, 1979) ; S. Korea—Geoje Is. (Lee & Kwon, 1979), Daegu(1♂, 1♀, 10, Ⅷ, 1979, coll. Y. J. Kwon). **Dstribution:** Korea, Japan (Honshu, Shikoku). **Hosts:** *Agrostis clavata* var. *nukabo, Zoisia japonica, Zoisia tenuifolia.*

25. *Delphacodes nigrigena* Matsumura et Ishihara. 1945 볼까만멸구
Mushi: 16 : 62.

Locality: unknown **Distribution:** Korea, Japan(Hokkaido, Honshu, Kyushu). **Host:** *Poa sphondylodes.*



Map 12. Distribution of *Muirodelphax matsuyamensis.*

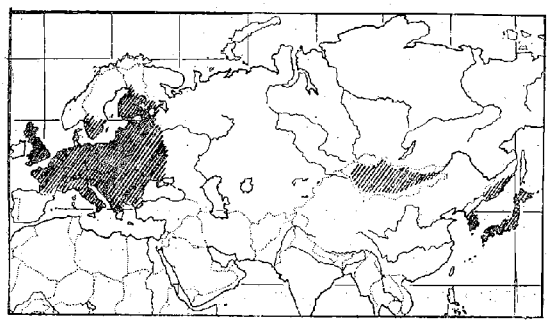
26. *Delphacodes gracilis* (Matsumura, 1915) 깔다구멸구
Trans. Sapporo Nat. Hist. Soc. 5 : 158, 179, 184 (*Liburnia* (*Delphax*) *gracilis*).

Locality: Mt. Baekdu(Matsumura, 1915). **Distribution:** Korea. **Host:** unknown.

27. *Paradelphacodes paludosa* (Flor, 1961) 반야월멸구

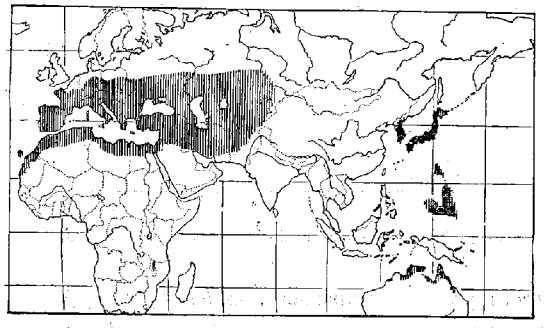
Rhynch. Livlands 2 : 82 (*Delphax paludosa*).

Localities: C. Korea—Mt. Seolak(1♂, 9, Ⅷ, 1976, coll. Y. J. Kwon); S. Korea —Daegu (Lee & Kwon, 1977), Banyaweol(Lee & Kwon, 1977), Haein Temple (Lee & Kwon, 1977). **Distribution**: Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu), U. S. S. R. (Maritime Territory, Estonia, Latvia, N. Russia), Austria, Belgium,



Map 13. Distribution trends of *Paradelphacodes paludosa*.

Czechoslovakia, Finland, France, German, England, Italy, Mongolia, Netherlands, Poland, Sweden. **Hosts**: *Oryza saliva.*, *Carex* sp., *Agropyron tsukushiense* var. *transiens*, *Dactylis glomerata*, *Echinochloa crus-galli* var. *crus-galli*, *Phalaris arundinacea*, *Poa annua*, *Sporobolus indicus*, *Triticum aestivum*, *Zizania latifolia*, *Reineckea carnea*, *Polygonium thunbergii*, *Oenanthe javanica*, *Miscanthus sinensis*.



Map 14. Distribution trends in the members of the genus *Toya*.
Vertical shaded area represents *T. propinqua*, horizontal shaded area represents *T. lyraeformis*.

28. *Toya lyraeformis* (Matsumura, 1900) 여수멸구

Ent. Nachr. 26 : 267 (*Liburnia lyraefrmis*).

Localities: C. Korea Mt. Obong(Lee & Kwon, 1977), Mt. Seolak(Lee & Kwon, 1977) ; S. Korea—Daegu(Lee & Kwon, 1977), Mt. Deogyu(Lee & Kwon, 1977), Mt. Sokni (1♂, 10, Ⅷ, 1979, coll. H. S. Lee). **Distribution**: Korea, Japan(Honshu, Shikoku, Kyushu), Micronesia, S. Mariana Is., W. Caroline Is. **Hosts**: *Oryza sativa*, *Eragrostis multicaulis*, *Leersia sayanuka*, *Pennisetum alopecuroides*, *Poa sphondylodes*, *Zoysia japonica*.

29. *Toya propinqua* (Fieber, 1866) 남방멸구

Verh. Zool. bot. Gesell. Wien 16 : 525, pl. 8(24) (*Delphax propinqua*).

Locality: unknown. **Distribution**: Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu, Bonin Is.), U. S. S. R. (Armenia, Georgia, Kazakhstan, Kirghizia, Moldavia, S. Russia, Tadzhikistan, Uzbekistan), Afghanistan, Albania, Algeria, Austria, Bulgaria, Canary Is., Cyprus, Czechoslovakia, Egypt, Finland, France, German, Hungary, Iran, Iraq, Israel, Italy, Jordan, Libya, Madeira Archipelago, Morocco, Poland, Portugal, Romania, Spain, Spainish Sahara, Tunisia, Turkey, Yugoslavia, Micronesia, Australa. **Hosts**: *Oryza sativa*, *Cynodon dactylon*, *Digitaria violascens*, *Echinochloa crus-galli*, *Miscanthus sinensis*, *Poa annua*, *Saccharum officinarum*, *Setaria italica*, *Zoysia japonica*.

30. *Terthron albovittatum* (Matsumura, 1900) 등줄멸구

Ent. Nachr. 26 : 269 (*Dicranotropis albovittata*).

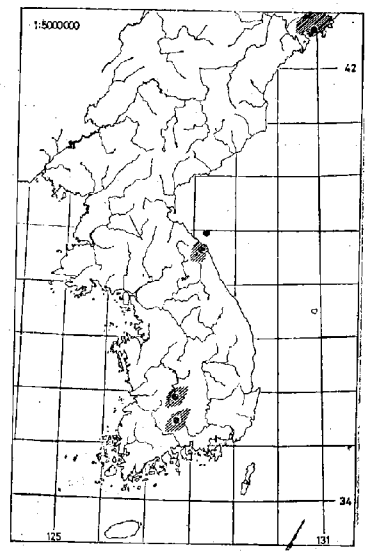
Localities: N. Korea—Hamgyeongbugdo Prov. (Okamoto, 1924), Pyeonganbugdo Prov. (Okamoto, 1924), Pyeongannamdo Prov. (Okamoto, 1924) ; C. Korea—Gyeonggido Prov. (Okamoto, 1924), Chungcheongnamdo Prov. (Okamoto, 1924, Seoul(Doi, 1936) ; S. Korea—Jeonlabugdo Prov. (Okamoto, 1924, Gyeongsangnamdo Prov. (Okamoto, 1924), Ulneung Is. (1♀, 3, Ⅷ, 1977, coll. Y. J. Kwon), Heuksan Is. (1♂, 15, Ⅷ, 1977, coll. Y. J. Kwon). **Distribution**: Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu, Ryukyu Is.). **Hosts**: *Oryza sativa*, *Cyperus serotinus*, *Echinochloa crus-galli* var. *crus-galli*, *Echinochloa crus-galli* var. *frumentacea*, *Imperata cylindrica* var. *koenigii*, *Leersia sayanuka*, *Miscanthus sinensis*, *Oplismenus undulatifolius* var. *japonicus*, *Paspalum thunbergii*, *Pennisetum alopecuroides*, *Poa acroleuca*, *Setaria viridis*, *Zoysia japonica*.

31. *Terthronella basalis* Matsumura, 1915) 민흰멸구

Trans. Sapporo Nat. Hist. Soc. 5 : 158, 178, 184 (*Liburnia*(*Delphax*)*basalis*).

Localities: C. Korea—Mt. Geumgang(Matsumura, 1915) ; S. Korea—Mt. Jiri(Lee & Kwon, 1977), Mt. Mayi(2♂♂, 3♀♀, 10, Ⅴ, 1980, coll. Y. J. Kwon). **Distribution**: Korea, U. S. S. R (Maritime Territory), **Host**: unknown.

This species seems endemic to mountain area in Korean Peninsula and Soviet Maritime Territory of Far East Asia. They are sexually dimorphic entirely, and usually brachypterous in spring.



Map 15. Distribution of *Terthronella basalis*.

32. *Cemus nigropunctatus* (Motschulsky, 1863) 흑점멸구

Bull. Soc. Nat. Hist. Moscow. 36 : 112 (*Mestus nigropunctatus*).

Localities: C. Korea—Mt. Sogeumgang(Kim & Kim, 1971), Jogaegol(Kim & Kim, 1971) ; S. Korea—Mt. Palgong(Lee & Kwon, 1977), Daegu(Lee & Kwon, 1977), Heuksan Is.(3♂♂, 1♀, 15, Ⅷ, 1977, coll. Y. J. Kwon), Tongdo Temple(2♂♂, 4♀♀, 9, Ⅹ, 1979, coll. Y. J. Kwon). **Distribution**: Korea, Japan(Honshu, Shikoku, Kyushu), Ceylon, India. **Hosts**: *Eriochloa villosa, Imperata cylindrica* var. *koenigii, Pennisetum alopecuroides, Phragmites communis, Zoysia japonica.*

33. *Garaga nagaragawana* (Matsumura, 1900) 들판멸구

Ent. Nachr. 26 : 265 (*Liburnia nagaragawana*)

Locality: S. Korea—Daegu(Lee & Kwon, 1977). **Distribution**: Korea, Japan(Hokkaido, Honshu, Shikoku, Kyushu), U. S. S. R. (Maritime Territory), Philippines. **Hosts**: *Miscanthus sinensis, Phragmites communis, Leersia sayanuka, Poa annua.*

Discussion

I. As a result of this study, the Korean Delphacidae may be fallen into several main geographical types of the specific distributional pattern, as follows:

(1) Endemic type: 2 species (6.1%) : ***Stenocranus koreanus, Delphacodes gracilis.***

These two species were originally described by Dr. Matsumura. Since they have been known from the type localities, we could not find any further collecting records.

(2) Korea—Japan type: 7 species (21.2%) : ***Stenocranus matsumurai, S. takasagonis, S. yasumatsui, Terauchiana nigripennis, Kakuna guwayamai, Muirodelphax matsuyamensis, Delphacodes nigrigena.***

Hitherto, they are only known to occur in Korean Peninsula and Japan proper but further investigations may extend their representing area to Far East Asia.

(3) Korea—Soviet Maritime Territory type: 1 species(3%) : ***Terthronella basalis.***

This species was oiginally described based on the material from Mt. Geumgang by Matsumura(1915), and recently recorded from Soviet Maritime Territory by Vilbaste(1968) with erecting the new genus.

(4) Far East Asia Type: 4 species(12.1%) : ***Stenocranus hokkaidoensis, Terauchiana singularis, Kakuna velitchkovskyi, Sogatella panicicola.***

The above range comprises Korean Peninsula, Soviet Maritime Territory, Manchuria and Japan proper.

(5) Palaearctic type: 2 species(6.1%) : ***Chloriona tateyamana, Paradelphacodes paludosa.*** Further species may be added through the intensive survey in future.

(6) Palaearctic—Oriental type: 17 species(51.5%) : ***Saccharosydne procerus, Tropidocephala brunnipennis, T. nigra, Unkanodes sapporona, Laodelphax striatellus Sogatella furcifera, S. longifurcifera, S. sirokata, S. terryi, Nilaparvata bakeri, N. lugens, N. muiri, Toya lyraeformis, T. propinqua, Terthron albovittatum, Cemus nigropunctatus, Garaga nagaragawana.***

The above range includes temperate zone of Eurasia and tropical regions of the old world.

Shown as the above fundamental zoogeographical analysis, more than half of Korean planthoppers are primarily derivatives of the southern factors. The tendency suggests that this family reaches its greatest development in the tropical regions of the world where their food sources are rich with mild climate.

References

Anufriev, G. A., 1970. New East-Asiatic delphacids from the genera ***Megalodelphax*** Wagner and ***Ribautodelphax*** Wagner (Homoptera, Delphacidae). Bull. Acad. Polon. Sci. (Ser. Sci. Biol.) 18(3) : 141—146.

....., 1977. Delphacids (Homoptera, Auchenorrhyncha) of the Kurile Islands fauna.

Zool. Zh. 56(6) : 855—869.

Atwal, A.S., J.P. Chandhary, and B.S. Sohi, 1967. Studies on the biology and control of *Sogatella furcifera* Horv. (Delphacidae: Homoptera) in the Punjab. Journ. Res. Punjab Agr. Univ. 4 : 547—555.

China, W.E., 1925. The Hemiptera collected by prof. J.W.Gregory's expedition to Yunnan, with synonymic notes on allied species. Ann. Mag. Nat. Hist. 16 : 449—485.

Distant, W.L., 1906. The fauna of British India, including Ceylon and Burma. Rhynchota, 3. Heteroptera—Homoptera: XV+503pp.

……, 1916. Ibid. 6. Homoptera, Appendix: 248pp.

Dlabola, J., 1967. Ergebnisse der 2. mongolisch-tsechoslowakischen entomologisch-botanischen Expedition in der Mongolei. Nr. 12 : Reisebericht, Lokalitäten, übersicht und Bearbeitung der gesammelten Zikaden (Homoptera, Auchenorrhyn.). Acta Faun. ent. Mus. Nat. Pragae 12 : 207—230.

Doi, H., 1936. Kontyu Zakki(Miscellanous notes on insects) Ⅶ. Journ. Chosen Nat, Hist. Soc. 21 : 102—108.

Emel'yanov, A.F., 1964. 1. Suborder Cicadinea. In Bei-bienko, G.Ya et al., Keys to insects of the European U.S.S.R. 1. Apterygota, Hemimetabola: 421—551pp. (English transl. 1967).

Esaki, T., 1932. Homoptera, Iconographia Insectorum Japonicum. Hokuryukan: 271—324.

……, 1936. Planthoppers of the rice (1). Agr. & Hort. 11(10) : 2179—2186.

Esaki, T. and T.Ishihara, 1947. Species nova vel minus cognita Araeopidarum Japonicarum (Hemiptera). Mushi 17 : 39—42.

……, 1950. Hemiptera of Shansi, North China. Hemiptera 1. Homoptera. Mushi 21 : 39—48, pl.5—7.

Fallén, C.F., 1806. Forsok till de svenska Cicad-Artearnas uppstallning och beskrifning. K.sevnska Vetensk-Akad. Handl. 27 : 6—43.

……, 1826. Cicadariae, earumque familiae. affines. Hemiptera Sveciae 2 : 1—80.

Fennah, R.G., 1956. Fulgoroidea from southern China. Proc. Calif. Acad. Sci. Ⅳ, 28 : 441—527.

……, 1956. Homoptera, Fulgoroidea supplement. Insects of Micronesia 6(3) : 39—211.

……, 1963. New genera of Delphacidae (Homoptera, Fulgoroidea). Proc. R. Ent. Soc. Lond. 32 : 15—16.

……, 1963. The delphacid species complex known as *Sogata furcifera*, (Horváth) (Homoptera, Fulgoroidea) Bull. Ent. Res. 54 : 45—79.

……, 1964. Delphacidae from Madagascar and the Mascarene Islands (Homoptera, Fulgoroidea). Trans. R. Ent. Soc. Lond. 116 : 131—150.

……, 1965. Delphacidae from Australia and New Zealand (Homoptera, Fulgoroidea). Bull. Brit. Mus. (Nat. Hist.)E nt. 7(1) : 1—59.

……, 1971. Homoptera, Fulgoroidea supplement. Insects of Micronesia 6(8) : 563—609.

Fieber, F.X., 1866. Neue Gattung und Arten in Homoptera Gattungen und Arten in Homopteren (Cicadina Bur.). Zool.-Bot. Gesell. Wien. Verh. 16 : 497—516.

Hasegawa, H., 1955. Some notes on the Japanese species of the genus *Nilaparvata* Distant(Homoptera, Delphacidae). Bull. Nat. Ins. Agr. Sci. Jap., ser. C(5) : 117—138.

Horváth, G., 1899. Hemmipteres de l'ile de Yesso(Japan). Termesz. Füzet. 22 : 365—374.

Hirano, J., 1967. On the plant-and leafhoppers recorded in the rice paddy field and its neighbouring grasses at Kukuyama province, Hiroshima-pref. Odokon-Chugoku 9 : 1—4.

Ishihara, T., 1949. Revision of the Araeopidae of Japan, Ryukyu Islands and Formosa (Hemiptera). Sci. Rep. Matsuyama Agr. coll. 2 : 1—102.

……, 1952. Delphacidae of Oze, Honshu, Japan. Ins. Mats. 18 : 35—37.

……, 1952. Some species of the Delphacidae new or unrecorded from Shikoku, Japan (Hemiptera). Sci. Rep. Matsuyama Agr. Coll. 8 : 39—47.

……, 1952. A new species of Delphacidae from Shikoku, Japan (Hemiptera). Mushi 24 (2) : 5—6, pl.1.

……, 1957. Faunistic notes on some Japaese Homoptera. Trans. Shikoku Ent. Soc. 5(5) : 68.

……, 1965. Taxonomic position of some leafhoppers known as virus vectors. Seminar of U. S—Japan cooperative science "Relationships betwcen arthropods & plant pathogenic viruses". 16pp. :

Kato, M., 1933. Three colour illustrated insects of Japan 4 : 9+50pls.

……, 1933. Notes on Japanese Homoptera, with descriptions of one new genus and some new species. Ent. World 1 : 452—471, pls.14—15.

Kim, C. W. and J. I. Kim, 1971. Insect fauna of Mt. Sohgumgang and Mt. Odae. Rep.Prel. Surv. Mt. Odae and Mt. Sohgumgang, Chunghak-dong. Rep. Kor. Ass. Conserv. Nat. 4 : 136—173.

Kim, C. W., J. K. Oh. Y. T. H. Shin, 1975. Faunistic study of insects near the DMZ. Rep. Kor. Ass. Conserv. Nat. 7 : 182—257.

Kisimoto, R., 1957. Studies on the polymorphism in the planthoppers (Homoptera, Araeopidae). Ⅲ. Differences in several morpholoogical and physiological characters between two wingforms of planthoppers. Jap. J. Ent. Zool. 1 : 164—173.

……, 1965. Studies on the polymorphism and its role playing in the population growth of the brown planthopper, *Nilaparvata lugens* Stål. Bull. Shikoku Agr. Exp. Stat. 13 : 1—106, 3pls.

……, 1975. Planthoppers cross the sea. Ser. Bibl. Nat., 233pp.

Kuwahara, M., K. Hiraoka, and K. Sakano, 1956. Experimental studies on ecology and hibernation in *Nilaparavata lugens* (S.). Norinsyo-Byogaityu-Haseiyosatu-Siryo 56 : 54—65.

Lee, C.E. and Y.J. Kwon, 1976. Faunistic investigation on a collection of Auchenorrhyncha from Mt. Chuwangsan. Korean J. Ent. 6(2) : 1—9.

……, 1977. Studies on the leafhoppers, spittlebugs and planthoppers(Hemiptera, Homoptera, Auchenorrhyncha). Nature & Life 7(2) : 55—111.

……, 1979. A check list of Auchenorrhyncha from Korea(Homoptera), In Lee, Illustrated flora & fauna of Korea 23, Ins.(Ⅶ) : 779—1018.

Lee, C.E., S.M. Lee, and Y.J. Kwon, 1976. An insect list of the Auchenorrhyncha preserved in the National Science Museum. Nature & Life 6 : 51—64.

Le Quesne, W.J., 1960. Hemiptera, Fulgoromorpha, In Handbooks for the identification of British insects. 2(3) : 68pp.

Matsumura, S., 1900. Uebersicht der Fulgoriden Japans. Ent. Nachr. Herausg. Dr. F. Karsch, Jahrgang 26 : 1—9.

……, 1915. Neue Cicadinen Koreas. Trans. Sapporo Nat. Hist. Soc. 5 : 154—184.

……, 1935. Revision of *Stenocranus* Fieb. (Homoptera) and its allied species in Japan Empire. Ins. Mats. 9(4) : 126—140.

……, 1935. Supplementary note to the revision of *Stenocranus* and its allied species of Japan empire. ibid. 10(1. 2) : 71—78.

Metcalf, Z.P., 1943. General catalogue of the Hemiptera. Fasc. Ⅳ. Fulgoroidea, Part 3, Araeopidae (Delphacidae). Northampton, Mass., Smith Coll., 552pp.

Mochida, O. and T. Okada, 1971. A list of Delphacidae(Homoptera) in Japan with special reference to host plants, transmission of plant diseases, and natural enemies. Bull. Kyushu. Agr. Exp. Stat. 15 : 737—843.

Muir, F., 1917. Homopterous notes. Proc. Haw. Ent. Soc. 3 : 311—338.

Nast, J., 1972. Palaearctic Auchenorrhyncha (Homoptera), an annotated check list. Polish Academy of Sciences, Warsaw, 550pp.

Okamoto, H., 1924. Study on planthoppers injourious to rice plant in Chosen. Bull. Agr. Exp. Stat. Gov. Gen. Chosen 12 : Ⅲ+37pp. 3pls.

Oshanin, V. T., 1912. Katalog der palaearktischen Hemiptera, 187pp.

Ossiannilsson, F. The Auchenorrhyncha (Homoptera) of Fennoscandia and Denmark. Part 1. Faun. Ent. Scand. 7(1), 222pp.

Otake, A., P. H. Somasundaram, and M. B. Abeykoon, 1976. Studies of *Sogatella furcifera* Horváth and *Nilaparavata lugens* Stål (Hemiptera: Delphacidae) and their parasites in Sri Lanka. Appl. Ent. Zool. 11(3) : 284—294.

Stål, C., 1854. Nya Hemiptera. Ofv. Svenska Vct. Akad. Forh. 11 : 231—255.

The rice brown planthopper, 1977. Food and Fertilizer Technology Center for the Asian and Pacific Region, 258pp.

Vilbaste, J., 1965. Über die Zikadenfauna Altais. Tallin, 144pp.

……, 1968. Über die Zikadenfauna des Primorje Gebietes. Tallin, 180pp. 14pls.

……, 1971. Eesti Tirdid Homoptera, Cicadinea 1. Tallin, 282pp.

Wagner, W., 1963. Dynamische Taxonomie, angewandt auf die Delphaciden Mitteleuropas. Mitt. Hamburg. Zool. Mus. 60 : 111—180.

Zimmerman, E.C., 1948. Insects of Hawaii. 4. Homoptera: Auchenorrhyncha, 628pp.

*Nature & Life(Kyungpook J. Biol Scis.)*10(1) : 43—45 June, 1980
Printed in Korea

Two New Species of Leafhoppers of the Genus *Pagaronia* Ball from Korea (Homoptera: Cicadellidae)

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Abstract: Described are two new species: *Pagaronia whangaksana* n. sp., and *P. jungsukae* n. sp.

Pagaronia whangaksana sp. nov.

General coloration pale yellow in dried specimen, pale green in living one. Head lacking any black spots as in *P. hallasana* Kwon et Lee, 1978. Male genitalia as figured. Pygofer lame without any process or folding structure. Aedeagus long, symmetrical, shaft broadend dorsoventrally, curved at base; tip armed with two pairs of terminal processes. Connective with median longitudinal keel, which is well developed and disc like.

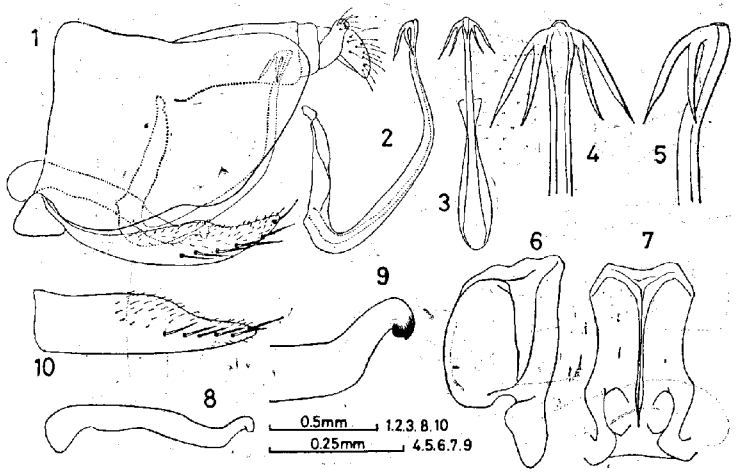

Fig. 1. Male genitalia of *Pagaronia whangaksana* n. sp.
1 : lateral view of pygofer, 2 : lateral view of aedeagus, 3 : caudal view of aedeagal tip, 4 : ditto, lateral view, 5 : lateral view of connective, 6 : ditto, dorsal view, 7 : lateral view of style, 8 : ditto, tip, 9 : ventral view of subgenital plate.