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New and Little Known Planthoppers of the Family Delphacidae (Homoptera: Auchenorrhyncha)

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멸구科 害虫의 新屬·新種 및 未記錄種에 관하여

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摘 要

極東亞細亞產 멸구類害虫 再檢討의 일환으로 整理하던 중 새로 2新屬, 3新種, 6新結合種 및 韓國未記錄 6屬 8種이 發見되었으므로 이에 報告코자 한다. 特히 國內에는 分布하지 않는 種으로서, 地中海沿岸에 分布하는 *Delphax tangira* Matsumura, 1910와, 필리핀, 대만 등 東洋區에 分布하는 *Kelisia kirkaldyi* Muir, 1917는 그 雄性生殖器의 構造로 보아 *Corbulo* 屬으로 各各 學名이 變更됨이 妥當하다고 思料된다. 그리고 韓國產 멸구類는 現在까지 24屬 44種이 알려지고 있으나 本 調査結果 모두 總 32屬 56種으로 整理된다. 또한 現在 日本에서 흑조위축병, 줄무늬잎마름병, 북지모자이크병등 바이러스病을 媒介하는 것으로 有名한 *Chilodelphax albifascia* (Matsumura, 1900)n. stat. (흰줄검정멸구 : 新稱)가 우리나라에도 發見되었으므로 이 媒介虫에 對한 調査가 必要하다.

INTRODUCTION

This paper is a preliminary study on the systematics of delphacid-pests with special reference to the Korean fauna. So far as the author is aware, a total of 44 species belonging to 24 genera have been known to occur in Korea, by C.E. Lee & Y.J. Kwon (1979, 1980), and K.R. Choe (1981). Recently the author carried out some investigations to resolve several uncertain generic positions of these pests which are still remain untouched state, and to give them the correct systematic taxa, he also intends to describe additional species new to science along with hitherto unrecorded ones from Korean peninsula. There is a few more species not as yet represented from Korean distribution, but they are excluded from the present report to save publication costs and will be continued separately before long.

In this report, 2 new genera, 3 new species, 6 new combinations, 2 new status, and 8 newly recorded species from Korea with 6 genera are treated. So, as for the Korean fauna, a total of 56 species under 32 genera are recognized to occur.

Before going further, the author wishes to express his cordial thanks to Prof. C.E. Lee and Prof. Y.E. Choi of Kyungpcok Nat. Univ., for their kind guidance. He is also grateful to Prof. T. Ishihara of Ehime Univ., Japan, Dr. T. Okada of Chugoku Nat. Agr. Exp. Stat., Japan, Prof. G.A. Anufriev of Gorky State Univ., U.S.S.R., Prof. J. Nast of Polish Academy of Sciences, Poland, and to Prof. C.L. Kuoh of Anhui Agr. College, China, for their kindness. Special thanks are due to Dr. K. Yamagishi of Kyushu University, Japan, and to Dr. P.

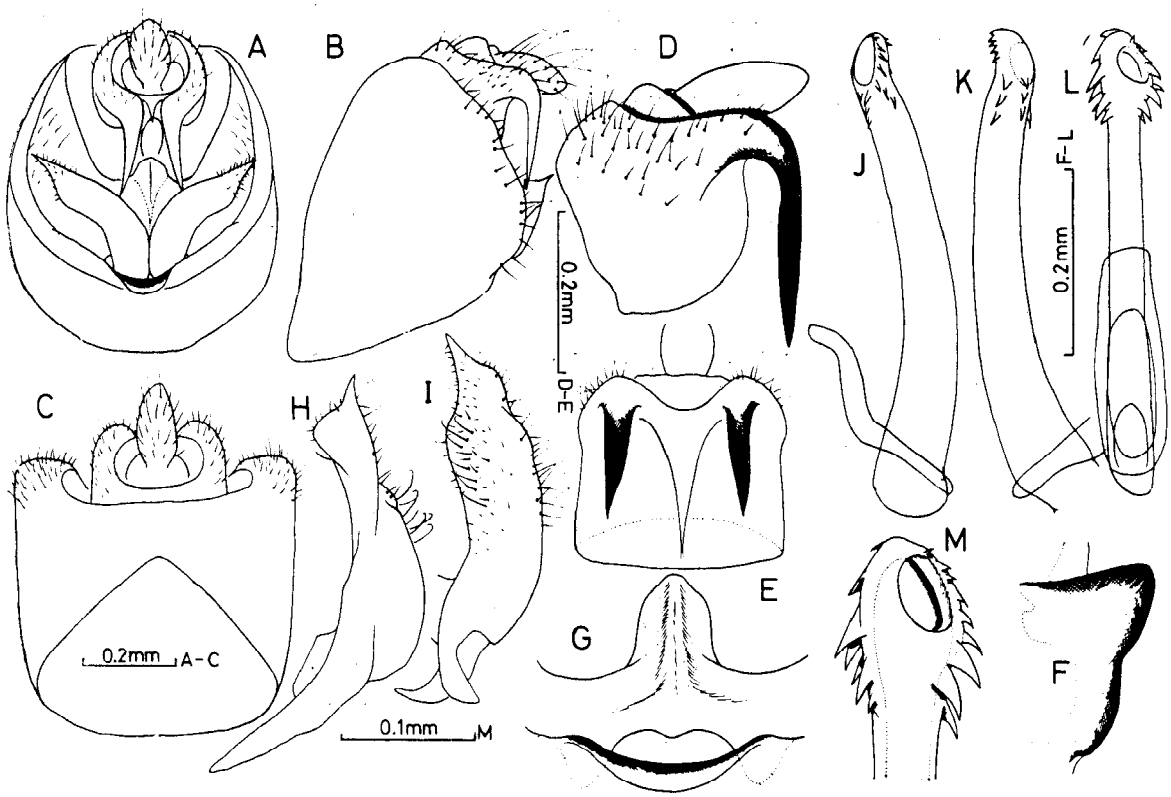

Fig. 1. Male genitalia of *Changeondelphax velitchkovskyi* (Melichar, 1913) gen.et comb. nov. A: caudal view of pygofer, B: ditto lateral view, C: ditto dorsal view, D: lateral view of anal tube, E: ditto caudoventral view, F: median process of diaphragm from side, G: ditto caudoventral view, H: outer lateral view of genital style, I: ditto caudal view, J: aedeagus from left, K: ditto right, L: ditto dorsal view, M: ditto tip.

Gilbert of British Museum (Nat. Hist.), U.K., for their kind convenience in huge literature. The author indebted to Mr. S.M. Lee of Nat. Sci. Museum for his constant encouragement.

All the type-specimens treated here are deposited in the collection of Systematic Entomology Lab. of K.P.U.

DESCRIPTION

Changeondelphax Kwon gen. nov.

Type-species : *Euidella velitchkovskyi* Melichar, 1913.

Body form typical for Criomophinae. Vertex slightly longer than wide, producing anteriorly, with lateral margins somewhat narrowed apically. Diaphragm of male pygofer with a median process which is not bifurcated. Anal tube with a pair of long processes curved downwards. Aedeagus long, cylindrical, apex armed with numerous asymmetrical denticles.

This new genus is closely allied to *Kakuna* Matsumura, 1935, but may be distinguished from it by the shape of vertex and by having the male anal tube bearing with long processes.

Changeondelphax velitchkovski (Melichar, 1913) gen. et comb. nov.

Previously known species, *Kakuna sapporonis* (Matsumura, 1935), from Korea and Japan is a Junior synonym of the above species. DISTRIBUTION: Korea, Japan, U.S.S.R. (Maritime Territory, Kurile Is.), China (Shansi, Anhui, Kiangsu, Liaoning).

Host Plant : *Typha laximanni.*

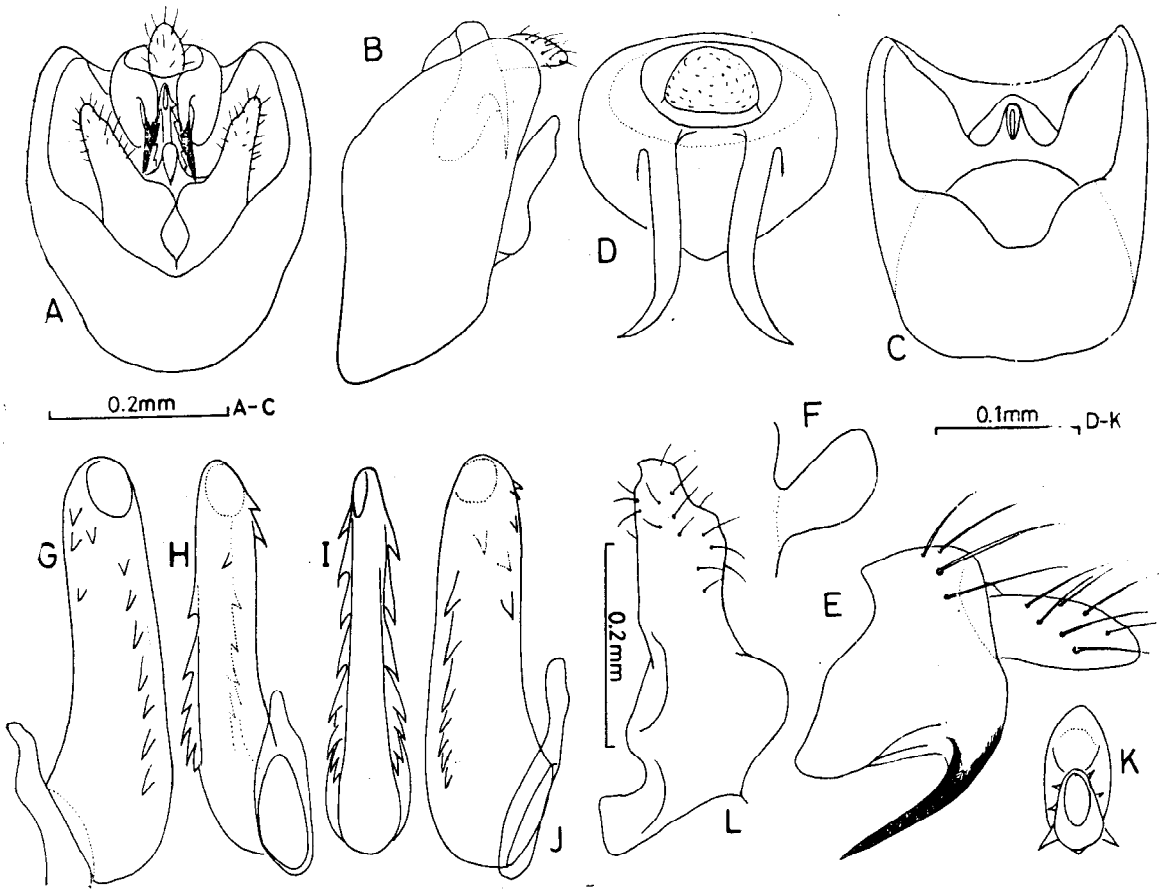

Fig. 2. Male genitalia of *Ishiharodelphax matsuyamensis* (Ishihara, 1952) gen. et comb. nov.
A: caudal view of pygofer, B: ditto lateral view, C: caudoventral view of diaphragm, D: caudal view of anal tube, E: ditto lateral view, F: median process of diaphragm from side, G: aedeagus from left, H: ditto laterodorsal view, I: ditto ventral view, J: ditto right, K: ditto apical view, L: lateral view of genital style.

Ishiharodelphax **Kwon gen. nov.**

Type-species : *Delphacodes matsuyamensis* Ishihara, 1952.

Body form small, relatively short and stout. Vertex about as long as wide, slightly expended apically, with carinae distinct.

Face distinctly exceeding half as wide as long. Spurs each armed with 9~10 minute teeth on posterior margin. Diaphragm of male pygofer with a median process which is papillar. Anal tube with a pair of sharp and long processes curved near base on posteroventral margin. Genital style somewhat stout, tapered to apex, proximal portion produced inwards. Aedeagus cylindrical, distal portion somewhat straight, armed with two rows of asymmetrical denticles on ventral side, and with several denticles on dorsal side of apex.

The present new genus is allied to *Falcotoya* Fennah, 1969, in external feature, but may be immediately distinguished from the latter by the male genitalic character.

Ishiharodelphax matsuyamensis **(Ishihara, 1952) gen. et comb. nov.**

This species overwinters as adult and seemed active at subzero temperature feeding on dried grasses in field as observed by the author.

Distribution : Korea, Japan.

Host Plant : *Zoysia japonica*, *Z. tenuifolia*, *Agrostis clavata* var. *nukabo*.

Muirodelphax atratus **Vilbaste, 1968**
검정잔디멸구(新稱)

Locality : Mt. Seolaksan, Mt. Odaesan, Mt. Hwan-

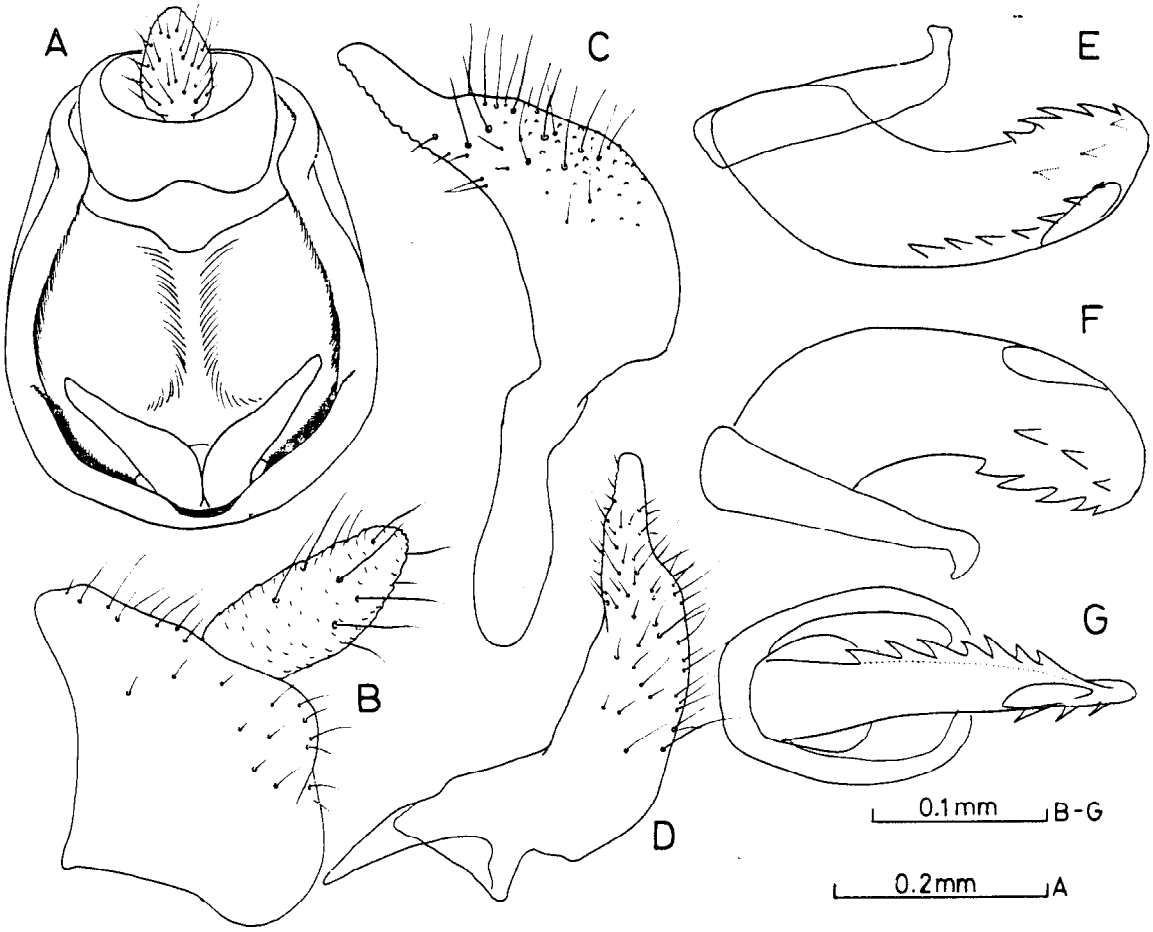

Fig. 3. Male genitalia of *Muirodelphax atratus* Vilbaste, 1968. A: caudal view of pygofer, B: lateral view of anal tube, C: caudal view of genital style, D: ditto outer lateral view, E: aedeagus from left, F: ditto right, G: ditto ventral view.

gaksan, Daegu City, Hayang Eup.

Distribution : Korea (new record), U.S.S.R. (Maritime Territory).

Host Plant : *Zoysia japonica.*

Coracodelphax obscurus **Vilbaste, 1968**
검은머리멸구(新稱)

Locality : Mt. Palgongsan.

Distribution : Korea (new record), U.S.S.R. (Maritime Territory).

Host Plant : *Zoysia japonica.*

Chilodelphax silvaticus **Vilbaste, 1968 stat. nov.** 극동검정멸구(新稱)

J. Vilbaste (1968) originally errected the above genus based on the species as a subgenus of *Unkanodes* Fennah, 1956, but male genitalic structure of the both type species are considerably different from each other only except the inflation of pygofer. Head structure is also different from it by having median carina on frons at junction with vertex which is much more prominent and convex.

Locality : Mt. Daedunsan.

Distribution : Korea (new record), U.S.S.R. (Maritime Territory).

Host Plant : Unknown.

Chilodelphax albifascia **(Matsumura, 1900) stat. nov.** 흰줄검정멸구(新稱)

This species is known as the viral vector of northern cereal mosaic, stripe, and black-streaked dwarf from Japan. So, it is noteworthy wheather the former transmit the most important crop pathogens at

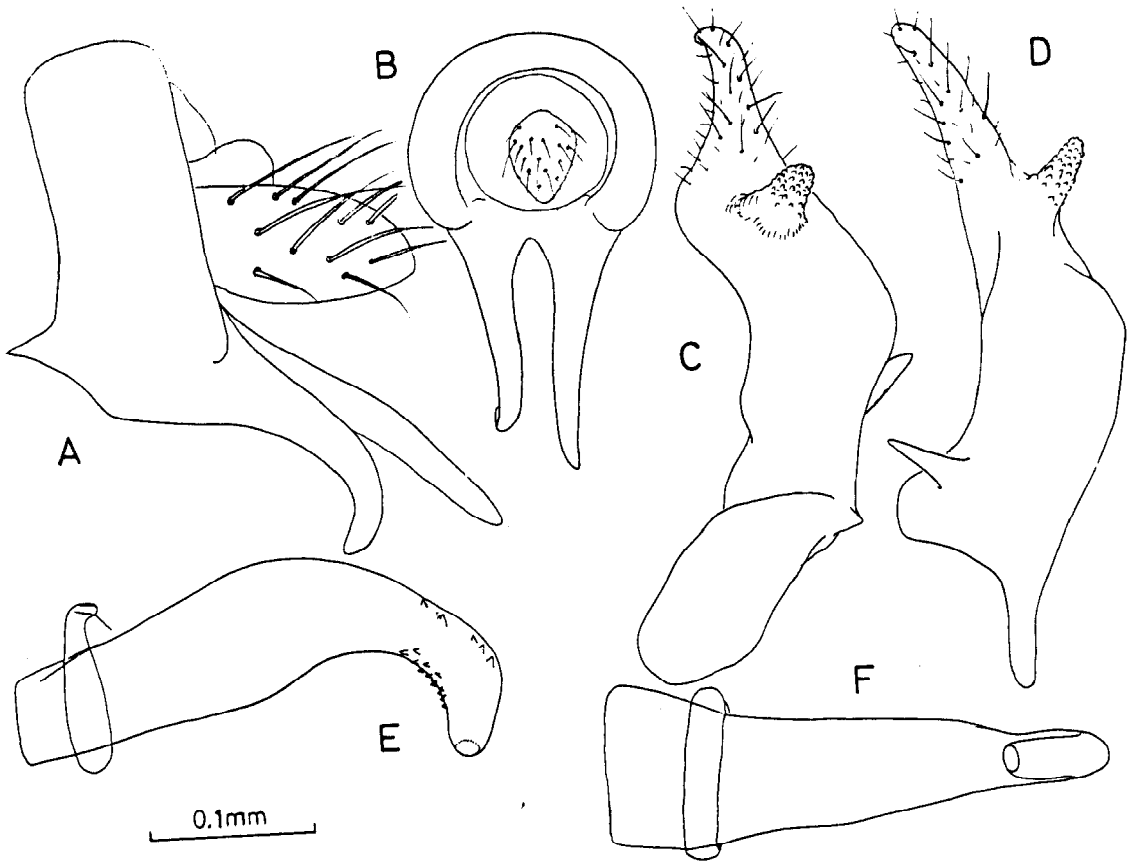

Fig. 4. Male genitalia of *Coracodelphax obscurus* Vilbaste, 1968.
A: lateral view of anal tube, B: ditto caudal view, C: lateral view of genital style, D: ditto ventral view, E: aedeagus from left, F: ditto ventral view.

rice paddy or field in Korea, as in the case Japan, her neighboring country.

Locality : Mt. Mayisan.

Distribution : Korea (new record), Japan, U.S.S.R. (Maritime Territory).

Host Plant : *Carex dimorpholepis, Arthraxon hispidus, Dactylis glomerata, Festuca arundinacea, Isachne globosa, Phleum pratense, Poa pratensis, Echinochloa crus-galli, Oryza sativa, Sorghum vulgare, Agropyron tsukushiense* var. *transiens, Alopecurus aequalis* var. *amurensis, Avena fatua, A. sativa, Beckmannia syzigachne, Hordeum distichon, H. vulgare, Lolium multiflorum, Phalaris arundinacea, Polypogon fugax, Secale cereale* (after Mochida & Okada, 1971).

Note : The above species was described under the genus *Liburnia* Stal, 1866, at first, and recently J. Vilbaste (1968) placed it into the subgenus *Chilodelphax* Vilbaste, 1968, of the genus *Unkanodes* Fennah, 1956, along with the preceding one, based on the material from Maritime Territory of U.S.S.R.

Unkanodelia ussuriensis **Vilbaste, 1968**
우수리멸구(新稱)

Locality : Mt. Jirisan.

Distribution : Korea (new record), U.S.S.R. (Maritime Territory).

Host Plant : Unknown.

Yanunka miscanthi **Ishihara, 1952**
억새멸구(新稱)

Locality : Is. Yokjido.

Distribution : Korea (new record), Japan.

Host Plant : *Miscanthus sinensis.*

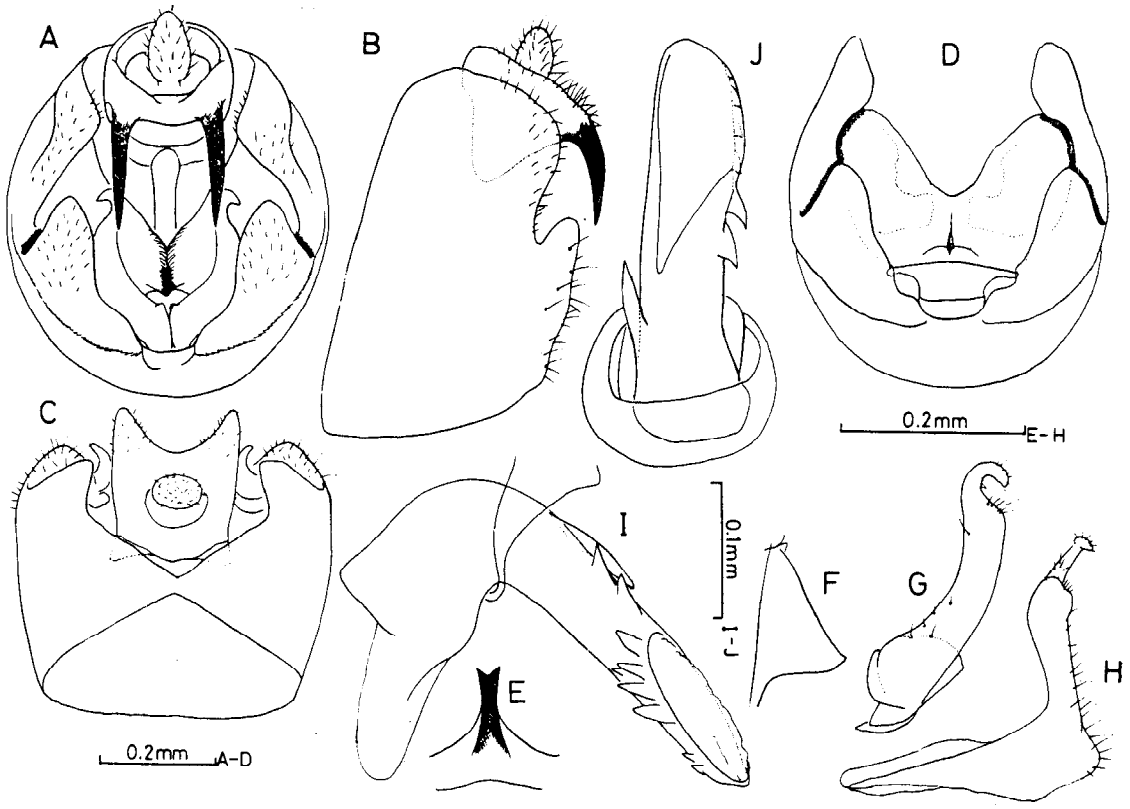

Fig. 5. Male genitalia of *Chilodelphax silvaticus* Vilbaste, 1968 stat. nov. A: caudal view of pygofer, B: ditto lateral view, C: ditto dorsal view, D: diaphragm from behind, E: median process of diaphragm from venter, F: ditto lateral view, G: caudal view of genital style, H: ditto lateral view, I: aedeagus from left, J: ditto dorsocaudal view.

***Opiconsiva sirokata* (Matsumura et Ishihara, 1945) comb. nov.**

Distribution : Korea, Japan, China.

Host Plant : *Oryza sativa*, *Echinochloa crus-galli*, *Phragmites communis*, *Polygonum thunbergii*.

***Opiconsiva anufrievi* Kwon sp. nov.**

어리가야멸구(新稱)

General coloration brown, with dark brown markings. Hind tibial spur armed with 15 minute teeth on posterior margin. Male genitalia as in figure. Posterodorsal margin of pygofer produced, bent inwards. Median process of diaphragm conical, scattered with microtubercles. Anal tube bearing with a pair of less sharp processes.

Aedeagus long tubular, cylindrical, unornamented. Outer distal process of genital style with margin more or less roundly curved.

Total Length : Macropterous male 4.3mm.

Type Examined : Holotype ♂, Is. Hongdo, Jeonnam Prov., Korea 9, Ⅷ, 1981, coll. Y.J.

Remarks : As pointed out by C.L. Kuoh (1981), this species was wrongly reported as *Toya tateyamella* (nec Matsumura, 1935) from Kurile Is. by G.A. Anufriev (1977). But it is evidently another species and described here as new one.

***Opiconsiva gayasana* Kwon sp. nov.**

가야멸구(新稱)

General coloration yellowish brown to dark brown. Hind tibial spur armed with 17-19 minute teeth on posterior margin. Male genitalia as in figure. Median process of diaphragm conical, rather slender, scattered with microtubercles. Aedeagus long, cylindrical, unornamented. Outer distal process of genital style with angular margin.

Total Length : Macropterous male 4.4mm, female

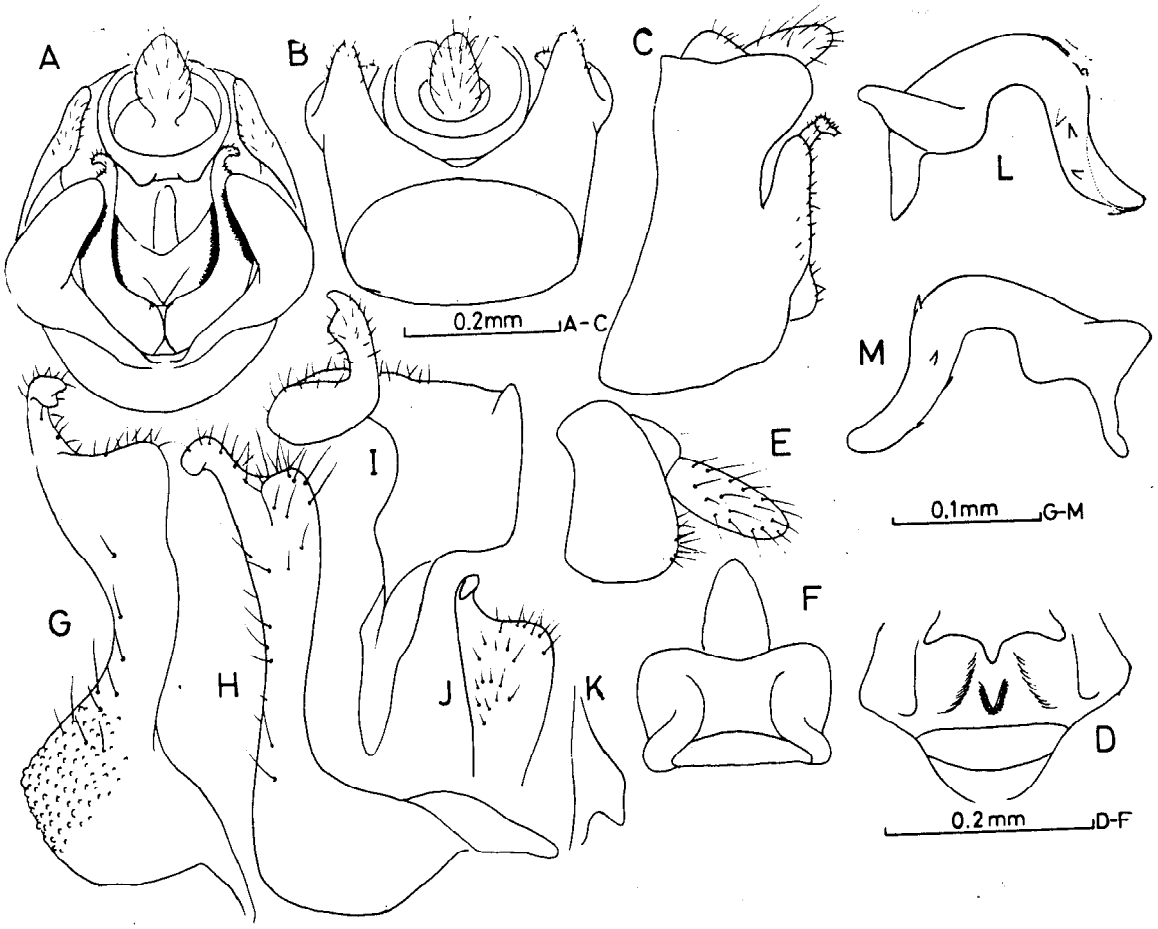

Fig. 6. Male genitalia of *Chilodelphax albifascia* (Matsumura, 1900) stat. nov. A: caudal view of pygofer, B: ditto dorsal view, C: ditto lateral view, D: caudal view of diaphragm, E: lateral view of anal tube, F: ditto ventral view, G: caudoventral view of genital style, H: ditto caudolateral view, I: ditto dorsal view, J: ditto tip from behind, K: median process of diaphragm from side, L: aedeagus from left, M: ditto right.

5mm; micropterous male 2.9mm.

Type Examined : Holotype ♂, Mt. Gayasan, Gyeongnam Prov., Korea, 2, Ⅶ, 1980, coll. Y.J. Kwon; paratypes: 6♂♂, 4♀♀, same data as holotype.

Remarks : The present new species is separated from other allied species by the male genitalia, especially in the shape of genital style.

Corbulo tangira (Matsumura, 1910) comb. nov.

Formerly this species was placed into the genus *Toya* Distant, 1906, by J. Nast (1975) treating with several junior synonyms, but may be well separable from it by the structure of male genitalia including the elevated area on basal half of aedeagus which is finely longitudinally striate.

Distribution : Morocco, Palestine, Italy(Sicily).

Corbulo kirkaldyi (Muir, 1917) comb. nov.

The above species is errornously treated in Metcalf's catalogue.

Distribution : Taiwan, Philippines, Fiji Is.

Corbulo koreacola Kwon sp. nov.

한국멸구(新稱)

Body yellowish brown. Hind tibial spur armed with 14 minute teeth on posterior margin. Male genitalia as in figure. Median process of diaphragm wedge like. Anal tube with a pair of slender sharp processes which are angularly bent at base. Aedeagus

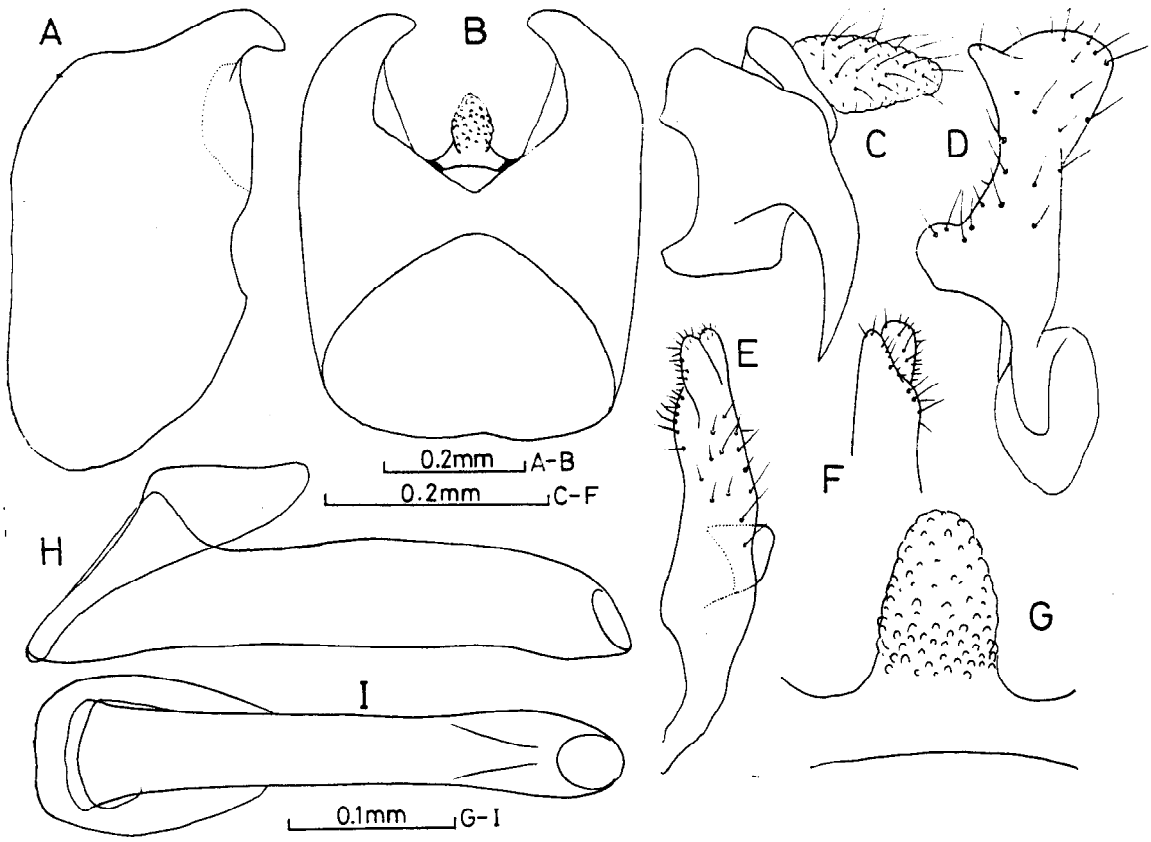

Fig. 7. Male genitalia of *Opiconsiva anufrievi* Kwon sp. nov.
A: lateral view of pygofer, B: ditto dorsal view, C: lateral view of anal tube, D: caudal view of genital style, E: ditto outer lateral view, F: ditto tip inner lateral view, G: median process of diaphragm, H: aedeagus from left, I: ditto ventral view.

cylindrical, dorsal side of proximal half elevated with finely longitudinally striate structure. Genital style extended at apex with inner and outer subacute processes, proximal portion produced at inner margin.

Total Length : Macropterous male 3.6mm.

Type Examined : Holotype ♂, Mt. Obongsan, Gangweondo Prov., Korea, 12, Ⅷ, 1976, coll. Y.J. Kwon.

Remarks : This new species is well distinguished from other allied species by the shape of male genitalia.

Indozuriel dantur **Kuoh, 1980** 흰띠멸구(新稱)

Locality : Mt. Soglisan, Mt. Geumjeongsan, Daegu City.

Distribution : Korea (new record), China(Hupeh, Fukien, Kwangsi).

Host Plant : Unknown.

Stiromella fusca **(Linnavuori, 1953)**
높은산멸구(新稱)

Locality : Mt. Jirisan.

Distribution : Korea (new record), U.S.S.R.(Kurile Is., Siberia, Kazakhstan).

Host Plant : Unknown.

Garaga vilbastei **(Choe, 1981) comb. nov.**

The genus *Nagara* Vilbaste, 1968 is invalid name as interpreted by G.A. Anufriev (1977).

Distribution : Korea, U.S.S.R. (Maritime Territory).

Host Plant : Unknown.

SUMMARY

This paper deals with some new genera and species

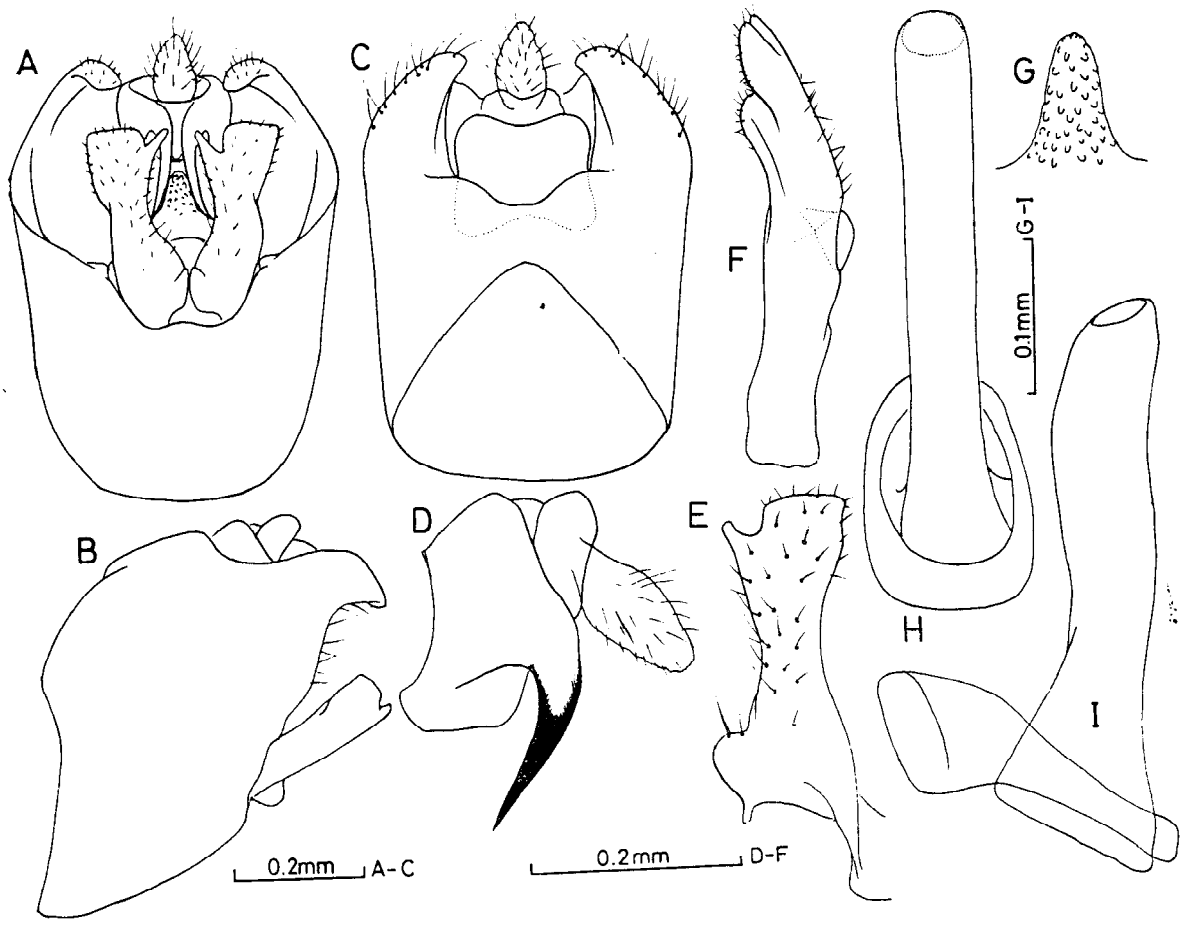

Fig. 8. Male genitalia of *Opiconsiva gayasana* Kwon sp. nov. A: caudal view of pygofer, B: ditto lateral view, C: ditto dorsal view, D: lateral view of anal tube, E: caudal view of genital style, F: ditto outer lateral view, G: median process of diaphragm, H: ventral view of aedeagus, I: ditto lateral view.

including new combinations of Delphacidae, with reference to Korean fauna.

Two new genera are errected: *Changeondelphax* n. gen., *Ishiharodelphax* n. gen. Three new species are described: *Opiconsiva anufrievi* n. sp., *O. gayasana* n. sp., and *Corbulo koreacola* n. sp. Six new combinations are made based on the male genitalic structure, and eight species with six genera are new for Korean fauna.

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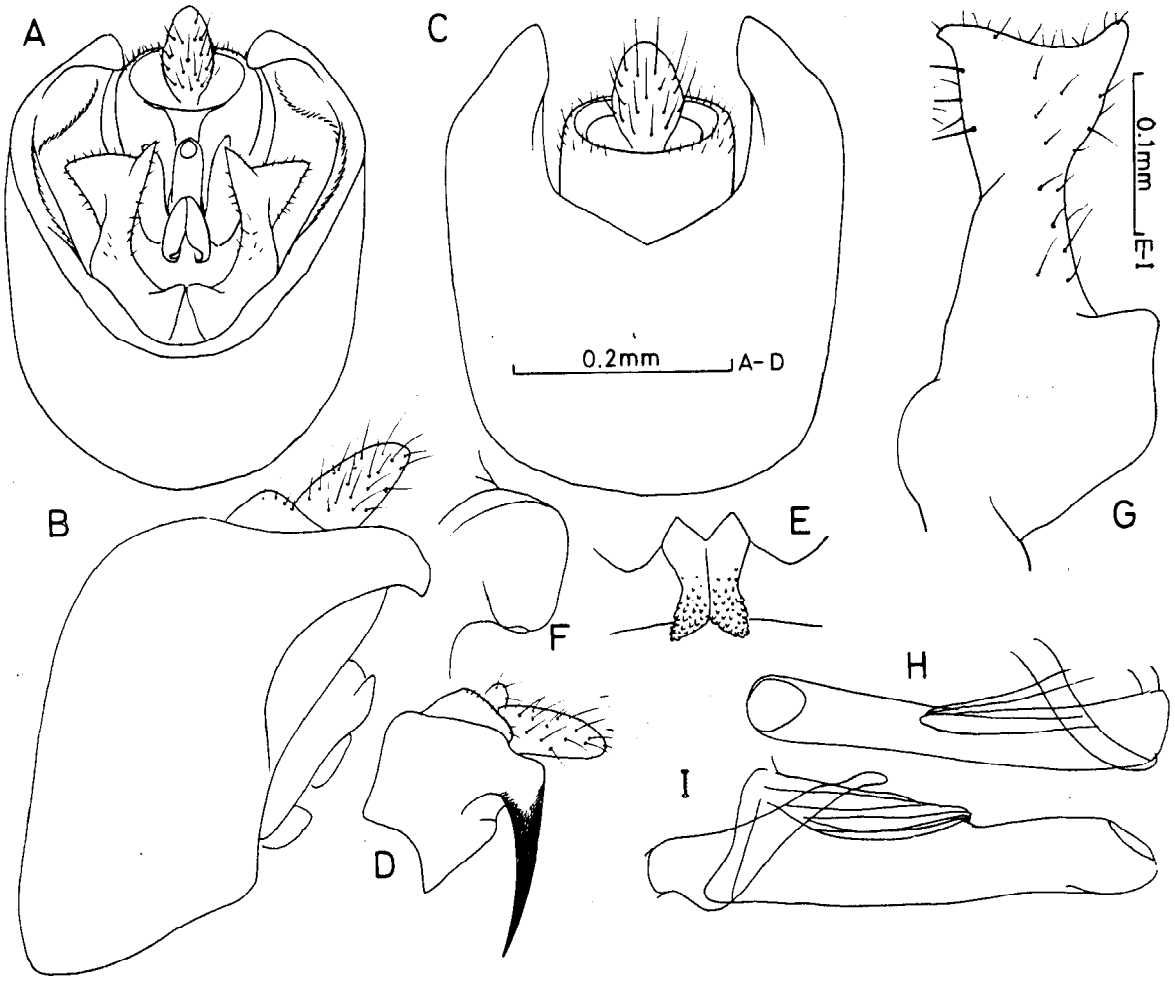

Fig. 9. Male genitalia of *Corbulo koreacola* Kwon sp. nov.
A: caudal view of pygofer, B: ditto lateral view, C: ditto dorsal view, D: lateral view of anal tube, E: median process of diaphragm, F: ditto lateral view, G: lateral view of genital style, H: dorsolateral view of aedeagus, I: ditto lateral view.

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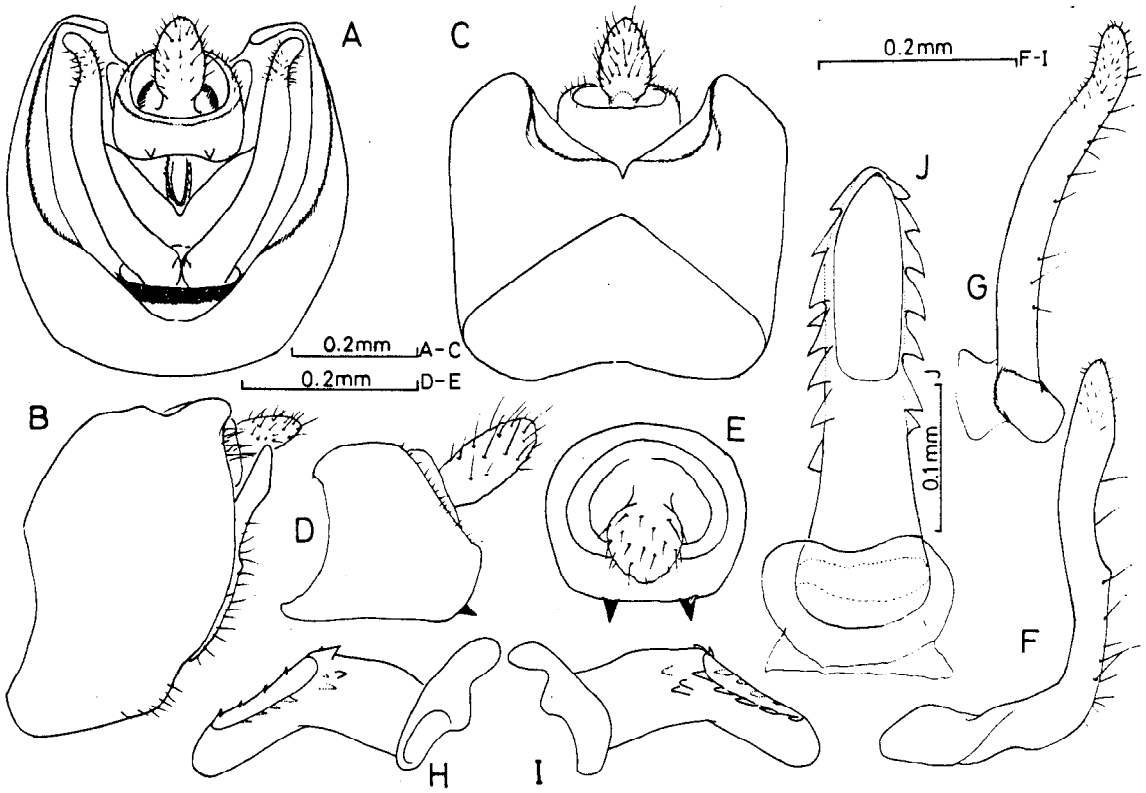

Fig. 10. Male genitalia of *Stiromella fusca* (Linnavuori, 1953). A: caudal view of pygofer, B: ditto lateral view, C: ditto dorsal view, D: lateral view of anal tube, E: ditto caudal view, F: lateral view of genital style, G: ditto caudal view, H: aedeagus from right, I: ditto left, J: ditto dorsal view.

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