Observation on the Lateral Carinae of the Pronotum in Paralimnini and Its Allfed Tribes (Homoptera, Cicadellidae, Deltocephalinae)

Kamitani, Satoshi

https://doi.org/10.5109/2605

出版情報：ESAKIA. 37, pp.25-33, 1997-09-30. Entomological Laboratory, Faculty of Agriculture, Kyushu University
バージョン：
権利関係：

ESAKIA, (37): 25-33. September 30, 1997

Observation on the Lateral Carinae of the Pronotum in Paralimnini and Its Allied Tribes (Homoptera, Cicadellidae, Deltocephalinae) [1)]

Satoshi KAMITANI

Entomological Laboratory, Faculty of Agriculture,
Kyushu University, Fukuoka, 8 12-8 1 Japan

Abstract. The lateral carinae on the pronotum of Cicadellidae were investigated for 44 species belonging to 13 tribes of Deltocephalinae and 7 species belonging to 6 allied subfamilies. The typical 2 states are recognized. The lateral carinae of the most examined species are well developed from anterior to posterior part. The carinae obscured posteriorly is observed in all species of Paralimnini and Doraturini, and some species of Deltocephalini.

Key words: Morphology, pronotum, Homoptera, Cicadellidae, Paralimnini.

Introduction

The morphological state of the lateral carinae on the pronotum, partly obscured, is important key character of Paralimnini to distinguish from the related tribes such as Doraturini and Deltocephalini (Emeljanov 1962, Ossiannilsson 1983). They suggested that not all species of this tribe have the state as synapomorphy. In the present study, the comparative morphology of the lateral carinae on the pronotum is discussed based on materials of Paralimnini, related tribes of Deltocephalinae and subfamilies.

Materials and Methods

The pronotum of dried specimens was dissected. The examined species are shown in table 1. All specimens except 3 deltocephaline species are collected in Japan. *Doratura gravis* and *Endria inimica* were collected from Canada. *Deltocephalus pulicaris* was from Germany. The pronotum was steeped in 5% solution of KOH, and boiled for 3 to 5 minutes until the organs became soft. After the treatment with potash, the materials were transferred to 25% solution of ethanol, and observed under a stereoscopic microscope. Sixteen species were observed through the electric scanning microscope: *Alobaldia tobae*. *Recilia oryzae*, *Exitianus fusconervosus*, *Laburrus impictifrons*, *Aconurella orientalis*. *Hecalus concentralis*, *Macrosteles quadrimaculatus*, *Hishimonus sellatus*. *Yanocephalus*

1) Contribution from the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka (Ser. 5, No. 4).

yanonis, Psammotettix striatus, Phlogotettix cyclops, *Scaphoideus festivus*, *Doratulina producta, Amimenus mojiensis, Xestocephalus nikkoensis* and *Pagaronia okadai*.

Results

The carinae runs from the anterior margin to the posterior margin of the pronotum. This character state is commonly observed in the Cicadellidae, but are obscure near the posterior margin in some tribes of Deltocephalinae.

The typical pattern of the carinae is the following two ones; the entirely developed carinae (Fig. 79), and the carinae obscured posteriorly (Fig. SO).

1. Paralimnini (Figs. l-5, 31-37)

All species classified into Paralimnini by Knight & Webb (1993) have the carinae gradually obscured posteriorly. The carinae of Paralimnus, type genus of Paralimnini, is obscured at posterior half of the pronotum. The carinae of *Diplocolenus*, *Jassus* and *Paralaevicephalus* are developed until anterior 2/5. Those of *Metalimnus* and. *Psammotettix* and *Sorhoanus* are developed over anterior 2/3.

2. **Deltocephalini** (Figs. 16- 19, 38-47)

This tribe has both states. The carinae of *Deltocephalus*, type genus, is entirely developed, and those of *Alobaldia, Endria* and *Recilia* are also entirely developed. The posterior 1/3 of *Endria* is very weakly carinated. *Futasujinus*, *Hengchunia*, *Takagiella* and *Yanocephalus* have the carinae obscured posteriorly.

3. **Doraturini** (Figs. 48-49)

Doratura is the type genus of this tribe, and the posterior 2/3 of its carina is obscure. The carinae of *Aconurella* is less developed, and the anterior 1/5 is distinct.

4. Other tribes and subfamilies (Figs. 6-15, 21-30, 50-78)

All other tribes of Deltocephalinae, Iassinae, Aphrodinae, Selenocephalinae, Penthiminae and Cicadellinae have the entirely developed state. The carinae of *Ptzlogotettix* is partly obscured near posterior margin in the observation by SEM. but is entirely developed in the observation by microscope.

Discussion

The partly obscure state is observed in the all paralimnine species examined. Two species of Doraturini and 4 species of Deltocephalini have also such state. This state is hypothesized as the evolutionary novelty occurred several times in deltocephaline lineage

in the present taxonomic system of Deltocephalinae (Oman *et al.*, 1990), or synapomorphy of these three tribes.

The 4 species of Deltocephalini must be classified to Paralimnini, if the taxonomic system based on the genital structures by Ossiannilsson (1983) and Giustina (1989) is applied for the examined species. The tribe has many morphological differences from Paralimnini, while Doraturini is suggested to be closely related to Paralimnini by Emeljanov (1962). Therefore, I concluded that the partly obscured state was obtained by the common ancestor of Paralimnini and Doraturini, and this is hypothesized to be a synapomorphy of these two tribes.

Acknowledgments

I wish to express my sincere gratitude to Prof. J. Yukawa (Ent. Lab., Fac. Agr., Kyushu Univ., Fukuoka) for his directions. My cordial thanks are due to Prof. Emeritus K. Morimoto (Fukuoka City) and Assoc. Prof. 0. Tadauchi (Ent. Lab., Fac. Agr., Kyushu Univ.) for their critical review of the manuscript and helpful comments for the present study. I am much indebted to Assoc. Prof. M. Hayashi (Biol. Lab.. Fac. Educ., Saitama Univ.), who read through the manuscript, gave me many kind suggestions and loaned many valuable specimens. I thank to Dr. S. Miyamoto (Fukuoka City) and Assoc. Prof. T. Yasunaga (Biol. Lab., Hokkaido Educ. Univ.) for their suggestions.

References

Emeljanov, A. F., 1962. New tribes of leafhoppers of the subfamily Euscelinae (Auchenorrhyncha, Cicadellidae). *En?. Oboz. (Moscow),* **41: 388-397.** (In Russian with English summary.)

Giustina, W. della., 1989. Homopterés Cicadellidae, vol. 3 (compléments). *In* "Fauna de France 73". 348 pp. Inst. Nat. Rech. Agron.. Paris.

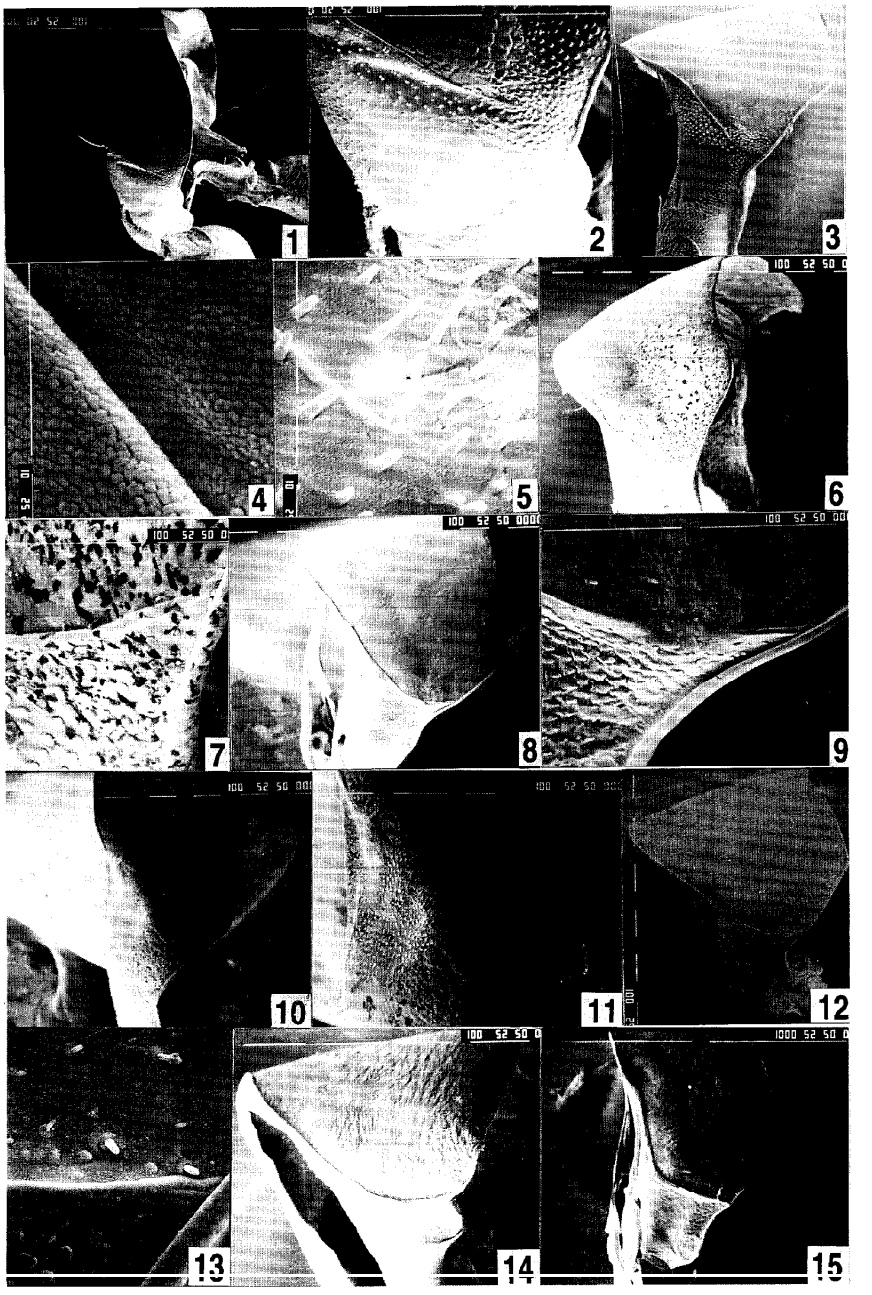
Knight, W. J. and M. D. Webb, 1993. The phylogenetic relationships between virus vector and other genera of macrosteline leafhoppers, including descriptions of new taxa (Homoptera: Cicadellidae: Deltocephalinae). *Syst. Ent.*, **18:** 1 l-55.

Oman, P. W., W. J. Knight and M. W. Nielson, 1990. *Leafhoppers (Cicadellidae): A Bibliography, Generic Check List and Index to the World Literature 1956 -1985. 368* pp. C.A.B. Intern. Inst. Ent., Oxon.

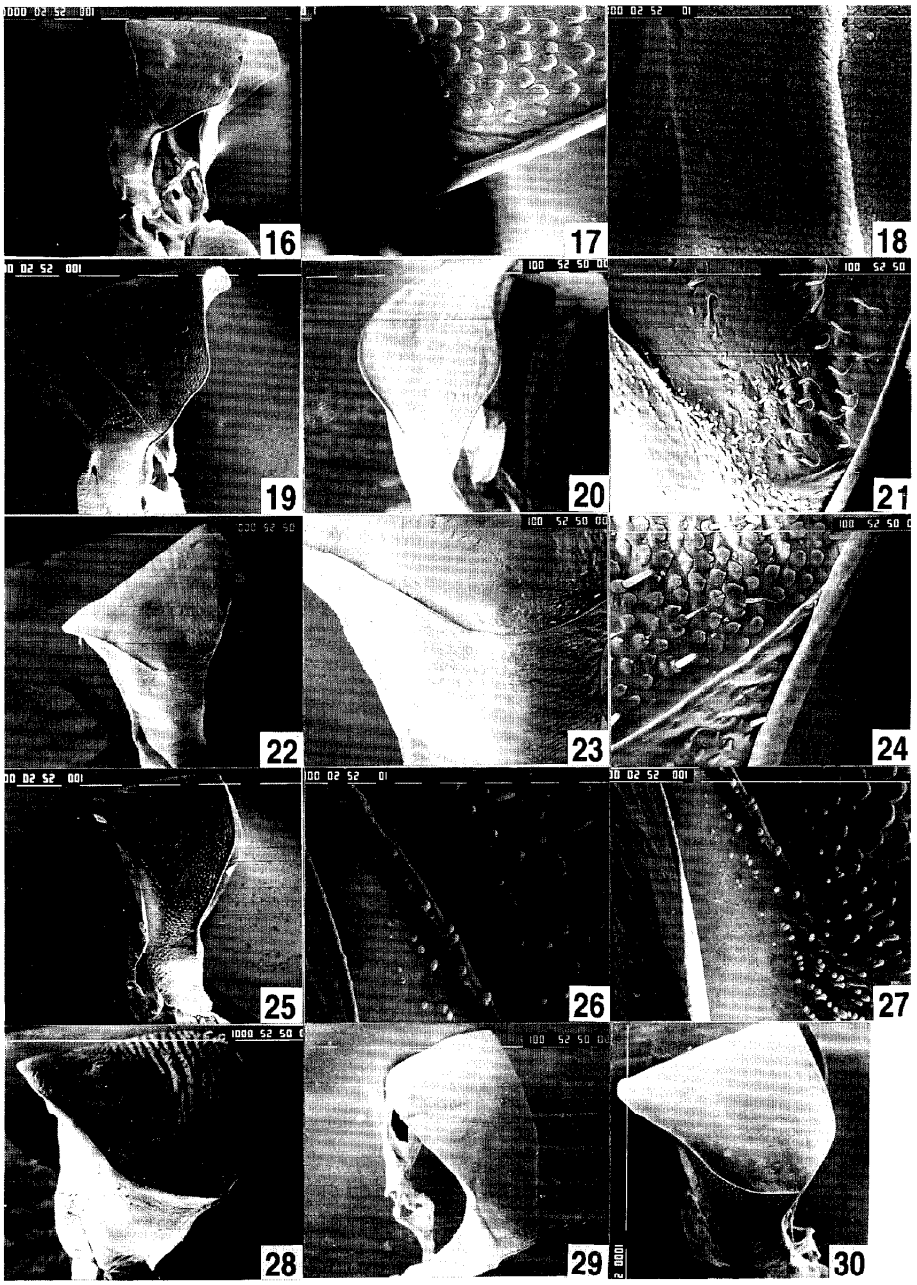
Ossiannilsson, F., 1983. The Auchenorrhyncha (Homoptera) of Fennoscandia and Denmark, part 3: the Family Cicadellidae: Deltocephalinae, Catalogue, Literature and Index, *Fauna Entomologica Scandinavica, vol. 7. 979* pp. Scand. Sci. Press Ltd., Copenhagen.

Table 1. List of the species examined.

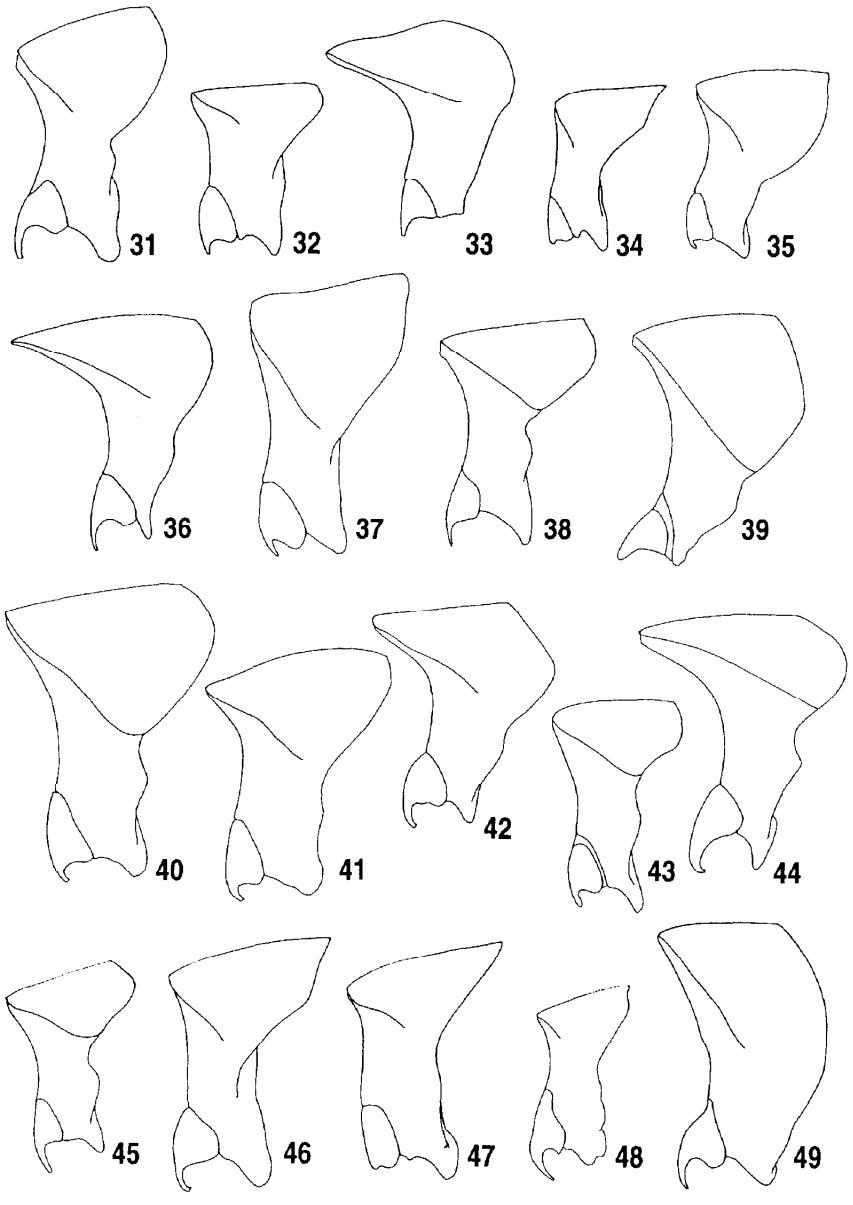
Subfamilies. Tribes	Species
Deltocephalinae	
Paralimnini	*Diplocolenus evansii, Jassargus repletus, Metalimnus marmoratus, Paralaevicephalus nigrifemoratus, Paralimnus tamagawanus, Psammotettix striatus, Sorhoanus tr-itici*
Deltocephalini	*Alobaldia tobae, Deltocephalus pulicaris, Endria inimica, Futasujinus candidus, Hengchunia koshuensis, Recilia coronifer, R. dorsalis, R. oryzae, Takagiella tezuyae, Yanocephalus yanonis*
Doraturini	*Aconurella orientalis, Doratura gravis*
Athysanini	*Albicostella kiushuensis, Exitianus fusconervosus, Handianus limbifer, Laburrus impictifrons, Matsumurella kogotensis, Nephotettix cincticeps, Orientus ishidae, Paramesodes albinervosus, Limotettix striola, Scleroracus jakowleffi*
Balcluthini	*Balclutha incisa*
Cicadulini	*Elymana sulphurella*
Hecalini	*Hecalus concentralis*
Macrostelini	*Macrosteles striifrons, Yamatotettixflavovittatus*
Opsiini	*Hishimonus sellatus*
Platymetopiini	*Phlogotettix cyclops*
Scaphoideini	*Scaphoideus albovittatus, S. festivus*
Scaphytopiini	*Japananus hyalinus*
Stenometopiini	*Doratulina (D.) producta, D. (Paivanana) indra*
Tribe incertae sedis	*Amimenus mojiensis*
Xestocephalinae	*Xestocephalus iguchii, X. nikkoensis*
Iassinae	*Batracomorphus mundus*
Aphrodinae	*Planaphrodes sahlbergi*
Selenocephalinae	
Selenocephalini	*Drabescus nigrifemoratus*
Paraboloponini	*Parabolopona guttatus*
Penthiminae	*Penthimia nitida*
Cicadellinae	*Pagaronia okadai*



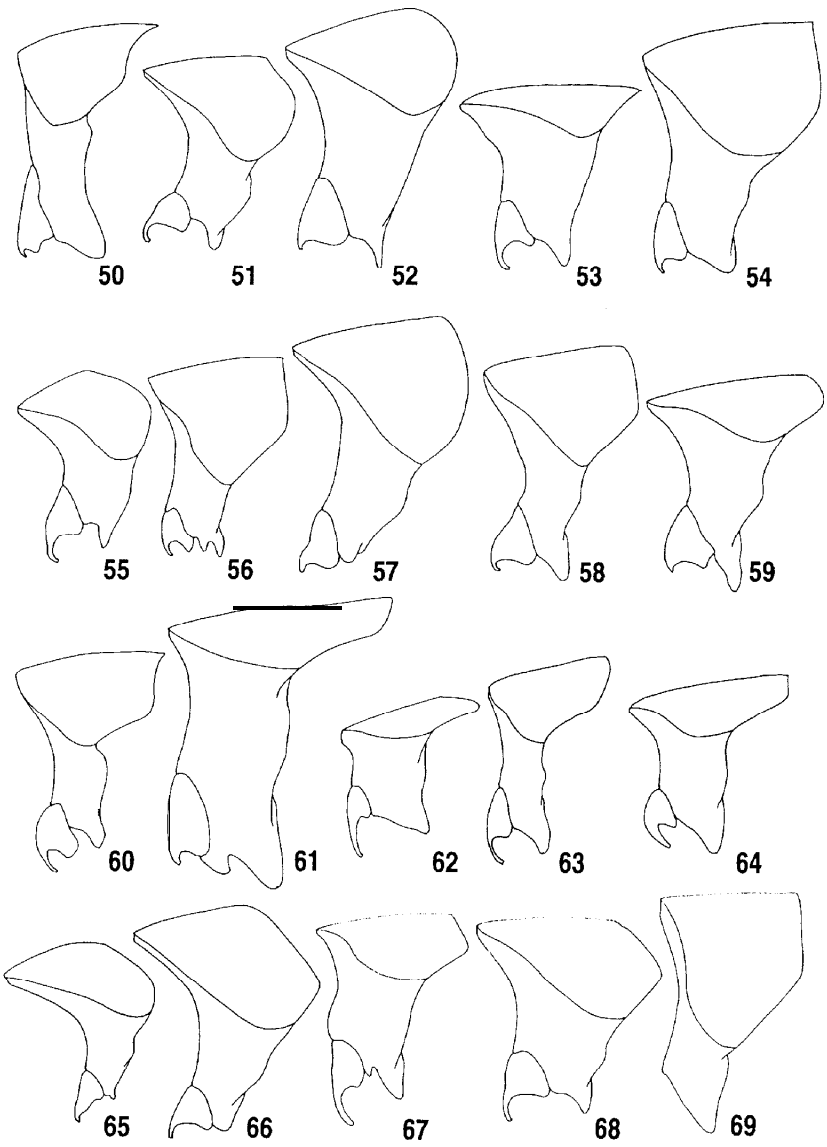
Figs. 1-15. Pronotum in lateral view. — 1-2, *Yanocephalus yanonis*; 3-5, *Psammotettix stroatus; 6-7, Scaphoideus festivus; 8-9, Phlogotettix cyclops*; 10-11, *Doratulina producta; 12-13, Amimenus mojiensis; 14, Xestocephalus nikkoensis; 15, Pagaronia okadai.*



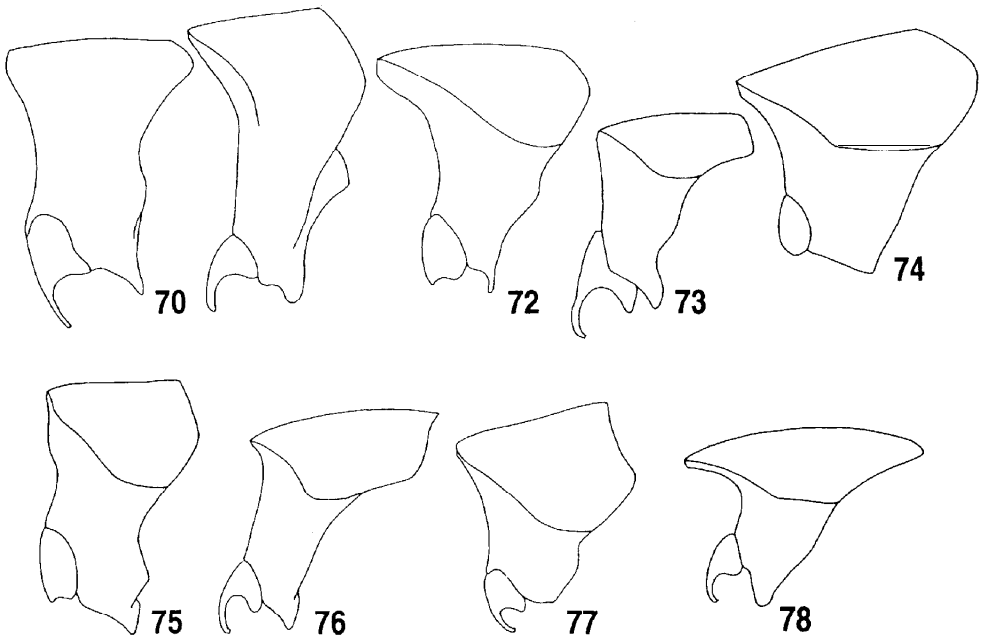
Figs. 16-30. Pronotum in lateral view. — 16-18, *Alobaldia tobae;* 19, *Recilia oryzae*; *20-2* 1, *Exitianus fusconervosus; 22-24, Laburrus impictifrons*; 25-27, *Aconurella orientalis; 28, Hecalus concentralis; 29, Macrosteles quadrimaculatus*; *30, Hishimonus sellatus.*



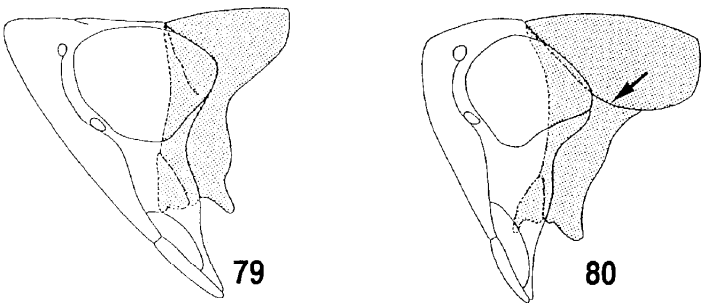
Fiigs. 31-49. Pronotum in lateral view. — 31, *Diplocolenus evansii;* 32, *Jassargus repletus*; 33, *Metalimnus marmoratus; 34, Paralaevicephalus nigrifemoratus*; 35. *Paralimnus sumigawanus*; 36, *Psammotettix striatus*; 37, *Sorhoanus tritici; 38, Alobaldia tobae; 39, Deltocephalus pulicaris; 40, Endria inimica*; 41, *Futasujinus candidus; 42, Hengchunia koshuensis; 43, Recilia coronifer*; 44. *R. dorsalis; 45. R. oryzae*; 46, *Takagiella tezuyae*; 47, *Yanocephalus yanonis*; 48, *Aconurella orientalis; 49, Doratura gravis.*



Figs. 50-69. Pronotum in lateral view. — 50, *Albicostella kiushuensis: 5* 1, *Exitianus f usconervosus; 52, Handianus limbifer; 53, Laburrus impictifrons*; 54, *Matsumurella kogotensis; 55, Nephotettix cincticeps; 56, Orientus ishidae*; 57. *Pnramesodes albinervosus; 58, Limotettix striola; 59, Scleroracus jakowleffi*; 60. *Balclutha incisa*; 61, *Elymana sulphurella*; 62, *Hecalus concentralis*; 63, *Macrosteles striifrons; 64, Yamatotettix flavovittatus*; 65, *Hishimonus sellatus*; 66, *Phlogotettix cyclops*; 6'7, *Scaphoideus albovittatus; 68, S. festivus*; 69, *Japananus hyalinus.*



Figs. 70-78. Pronotum in lateral view. — 70, *Doratulina (D.) producta; 7* 1, *D. (Paivanana) indra; 72, Amimenus mojiensis; 73, Xestocephalus nikkoensis; 74, Batracomorphus mundus; 75, Planaphrodes sahlbergi; 76, Dra bescus nigrifemoratus; 77, Parabolopona guttatus; 78, Penthimia nitida.*



Figs. 79-80. Head and pronotum. — 79, pronotum with carinae obscured posteriorly; 80, pronotum with entirely developed carinae.