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COMPARATIVE MORPHOLOGY AND EVOLUTION  
OF THE HIND WINGS OF THE FAMILY  
*CHRYSOMELIDAE* (Coleoptera)

IV. Subfamilies *Chlamisinae*, *Lamprosominae* and *Eumolpinae*

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The subfamily *Chlamisinae* (formerly *Chlamydinae*) had long been treated as a member of the Division (or Section) *Camptosomes* (Chapuis, 1874; Jacoby, 1908; Gressitt, 1942; and many others). But, Chen (1940) treated them (including the subfamily *Lamprosominae*) as a subfamily of his family "*Cryptocephalidae*". The two subfamilies, *Lamprosominae* and *Eumolpinae*, had long been included in the Division *Cyclica* (Chapuis, 1874; Jacoby, 1908; Gressitt, 1942; and many others). But, Chen (1940) treated the *Lamprosominae* as a tribe of his subfamily *Chlamydinae* and the *Eumolpinae* as his family "*Eumolpidae*". More recently, Chûjô (1953) treated the above three subfamilies, *Chlamisinae*, *Lamprosominae* and *Eumolpinae*, as his Divisions IX, X and XI, respectively. As shown in the above short historical review, the assumption of the systematic relationships among these three subfamilies are very difficult and, therefore, the accumulation of more materials is needed.

Though the hind wing venations of these subfamilies were studied synthetically by Jolivet (1957) and fragmentally by Chûjô (1953, 1955a, b, 1956, 1958), Chen (1940), Crowson (1955), and many others, the present author will attempt to suppose the evolutionary processes of hind wing venation chiefly basing on the comparative morphology and consider the phylogenetic sequences in these subfamilies.

**Materials and Methods**

The materials examined by the author himself were collected from various locality of Japan by many collaborators and the author himself.

X. Subfamily *Chlamisinae* Gressitt, 1946

*Chlamisus laticollis* (Chûjô, 1942)

2 exs., Mt. Sekirouzan, Kanagawa Pref., Honshu, 5-V, 1966, K. Suzuki leg.

*Chlamisus spilotus* (Baly, 1873)

1 ex., Eda, Kanagawa Pref., Honshu, 8-V, 1969, K. Suzuki leg.; 1 ex., Foot of Mt. Ôyama, Kanagawa Pref., Honshu, 8-VI, 1969, K. Suzuki leg.; 1 ex., Chôjahara, Foot of Mt. Iide, Yamagata Pref., Honshu, 30-VI, 1969, K. Suzuki leg.

XI. Subfamily *Lamprosominae* Achard, 1914*Oomorhoides cupreatus cupreatus* (Baly, 1873)

10 exs., Mt. Ôgusu, Kanagawa Pref., Honshu, 9-V, 1965, K. Suzuki leg.; 1 ex., Eda, Kanagawa Pref., Honshu, 2-V, 1969, K. Suzuki leg.

*Oomorphus japonus* Jacoby, 1885

4 exs., Mt. Jômine, Saitama Pref., Honshu, 9-V, 1965, K. Suzuki leg.

XII. Subfamily *Eumolpinae* Jacoby, 1908*Bromius obscurus japonicus* (Ohno, 1960)

2 exs., Kirigamine-Kôgen, Nagano Pref., Honshu, 22-VII, 1963, K. Suzuki leg.; 2 exs., Shiga-Kôgen, Nagano Pref., Honshu, 19-VIII, 1969, K. Suzuki leg.

*Basilepta ruficolle* (Jacoby, 1885)

2 exs., Spa Kirizumi, Gumma Pref., Honshu, 3-VII, 1965, K. Suzuki leg.; 1 ex., Chôjahara, Foot of Mt. Iide, Yamagata Pref., Honshu, 28-VI, 1969, K. Suzuki leg.

*Basilepta pallidulum* (Baly, 1874)

4 exs., Mt. Sakura, Zushi-City, Kanagawa Pref., Honshu, 12-VII, 1959, K. Suzuki leg.

*Basilepta fulvipes* (Motschulsky, 1860)

6 exs., Ôdomari, Pen. Ôsumi, Kagoshima Pref., Kyushu, 12-VI, 1966, K. Suzuki leg.; 1 ex., Izumi-Tamagawa, Tokyo Pref., Honshu, 24-VI, 1969, K. Matsuki leg.; 2 exs., Chôjahara, Foot of Mt. Iide, Yamagata Pref., Honshu, 30-VI, 1969, K. Suzuki leg.

*Basilepta balyi* (Harold, 1877)

3 exs., Mt. Sekirouzan, Kanagawa Pref., Honshu, 5-V, 1966, K. Suzuki leg.; 1 ex., Pass Daibosatsu, Yamanashi Pref., Honshu, 8-VIII, 1967, K. Sakai leg.; 1 ex., The same locality, 24-V, 1969, K. Suzuki leg.

*Nodina chalcosoma* Baly, 1874

7 exs., Cape Sata, Pen. Ôsumi, Kagoshima Pref., Kyushu, 13-VI, 1966, K. Suzuki leg.

*Colposcelis signata* (Motschulsky, 1858)

6 exs., Mt. Ichifusa, Kumamoto Pref., Kyushu, 8-VI, 1966, K. Suzuki leg.; 2 exs., Eda, Kanagawa Pref., Honshu, 8-V, 1969, K. Suzuki leg.

*Scelodonta lewisi* Baly, 1874

11 exs., Mizonokuchi, Kanagawa Pref., Honshu, 10-VI, 1963, K. Suzuki leg.; 1 ex., Eda, Kanagawa Pref., Honshu, 8-V, 1969, K. Suzuki leg.

*Lypesthes ater ater* (Motschulsky, 1860)

3 exs., Agano, Saitama Pref., Honshu, 22-VII, 1967, K. Suzuki leg.

*Lypesthes itoi* Chûjô, 1954

1 ex., Mt. Ichifusa, Kumamoto Pref., Kyushu, 10-VI, 1966, K. Suzuki leg.

*Hyperaxis fasciata* (Baly, 1874)

1 ex., Mizonokuchi, Kawasaki-City, Kanagawa Pref., Honshu, 26-IV, 1959, K. Suzuki leg.; 2 exs., The same locality, 29-IV, 1960, K. Suzuki leg.; 1 ex., Spa Yumura, Hyôgo Pref., Honshu, 4-X, 1969, K. Suzuki leg.

*Demotina fasciculata* Baly, 1874

1 ex., Mt. Ôgusu, Kanagawa Pref., Honshu, 5-V, 1965, K. Suzuki leg.; 2

- exs., The same locality, 9-V, 1965, K. Suzuki leg.
- Demotina major* Chûjô, 1958  
2 exs., Nago, Is. Okinawa, LooChoo, 31-V, 1965, K. Takahashi leg.
- Demotina modesta* Baly, 1874  
1 ex., Mt. Ôyama, Kanagawa Pref., Honshu, 8-VI, 1969, K. Suzuki leg.
- Irichochrysea japana japana* (Motschulsky, 1860)  
1 ex., Nakatsugawa-Keikoku, Kanagawa Pref., Honshu, 19-VI, 1959, K. Suga leg.; 1 ex., Kobotoke-tôge, Tokyo Pref., Honshu, 11-V, 1957, Y. Iwatsuki leg.; 1 ex., Tama Hill, Tokyo Pref., Honshu, 26-V, 1963, M. Nishikawa leg.; 1 ex., Kuroyama-Santaki, Saitama Pref., 8-VI, 1969, N. Tamiya leg.
- Colasposoma dauricum* Mannerheim, 1849  
3 exs., Yagumo-chô, Meguro, Tokyo Pref., Honshu, 12-VI, 1959, K. Suzuki leg.; 3 exs., Mizonokuchi, Kawasaki-City, Kanagawa Pref., Honshu, 14-VI, 1959, K. Suzuki leg.; 1 ex., Mt. Ôgusu, Kanagawa Pref., Honshu, 8-VI, 1965, K. Suzuki leg.; 1 ex., Eda, Kanagawa Pref., Honshu, 15-VI, 1969, K. Suzuki leg.
- Colasposoma auripenne* (Motschulsky, 1860)  
5 exs., Mabuni, Is. Okinawa, LooChoo, 8-VI, 1965, K. Mizusawa leg.
- Acrothinium gaschkevitchii gaschkevitchii* (Motschulsky, 1860)  
1 ex., Mt. Hiko, Fukuoka Pref., Kyushu, 7-VI, 1966, K. Suzuki leg.; 1 ex., Mt. Ichifusa, Kumamoto Pref., Kyushu, 9-VI, 1966, K. Suzuki leg.; 1 ex., Izuhara, Is. Tsushima, 9-VI, 1964, H. Nakajima leg.; 1 ex., Spa Ôdaru, Pen. Izu, Shizuoka Pref., Honshu, 19-V, 1965, K. Suzuki leg.; 2 exs., Nakatsugawa-Keikoku, Kanagawa Pref., Honshu, 19-VI, 1959, K. Suga leg.; 2 exs., Mt. Daisen, Tottori Pref., Honshu, 20-VII, 1967, K. Sakai leg.; 2 exs., Eda, Kanagawa Pref., Honshu, 8-V, 1969, K. Suzuki leg.
- Cleoporus variabilis* (Baly, 1874)  
1 ex., Kirigamine-Kôgen, Nagano Pref., Honshu, 25-VII, 1964, K. Suzuki leg.; 2 exs., The same locality, 13-VIII, 1964, K. Suzuki leg.; 3 exs., Mt. Daisen, Tottori Pref., Honshu, 20-VII, 1967, K. Sakai leg.
- Platycorynus japonicus* (Jacoby, 1896)  
4 exs., Yona Forest, Is. Okinawa, LooChoo, 4-VI, 1965, K. Takahashi leg.
- Colaspoides fulva* (Chûjô, 1935)  
2 exs., Mt. Nagodake, Is. Okinawa, LooChoo, 6-VI, 1965, K. Takahashi leg.
- The methods for this study are as applied in the previous paper (Suzuki, 1969b). As for the material unable to examine, the figures of hind wings already published, chiefly by Jolivet (1957), were used for comparison.

### Observations and Discussions

#### A. General structures

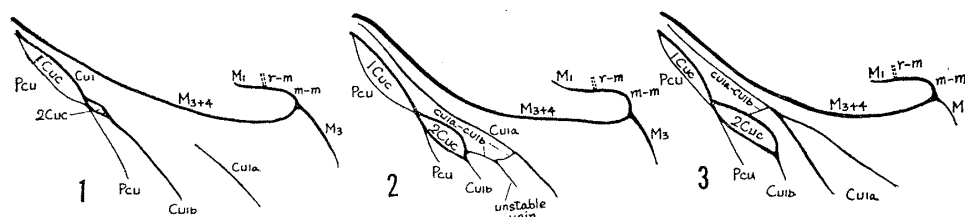
##### X. Subfamily *Chlamisinae* (Fig. 1)

The *r*-crossvein incidentally disappears.  $Cu_{1a}$  is always a single vein and is completely isolated from the other veins.  $Cu_{1b}$  forms a  $2Cuc$  by the branching of itself at about the middle part but it often disappears.  $Pcu$  always fuses with

$Cu_{1b}$  directly at about the middle.  $Cu_{1b}$  and  $Pcu$  are often completely fused with each other.

#### XI. Subfamily *Lamprosominae* (Fig. 2)

$Cu_{1a}$  is somewhat variable and fuses with the base or near the middle part of  $M_{3+4}$  by  $m-cu$  which often disappears.  $Cu_{1a}$  forks into two subbranches at the distal half but incidentally it does not fork.  $Cu_{1b}$  forms a large  $2Cuc$  by the branching of itself.  $Pcu$  always fuses with about the middle part of  $Cu_{1b}$ .



Figs. 1-3. Schematic right hind wing venation (*Vannal region* only). 1. *Chlamisinae* (*Chlamisus* type); 2. *Lamprosominae* (*Lamprosoma*+*Lychnophaes* type); 3. *Eumolpinae* (*Euryopini* type).

#### XII. Subfamily *Eumolpinae* (Fig. 3)

$Cu_{1a}$  is very variable and practically forks into two subbranches at about 2/3 from the base.  $Cu_{1b}$  forms a large  $2Cuc$  at about the middle.  $Pcu$  always fuses with about the middle part of  $Cu_{1b}$ .  $Cu_{1b}$  and  $Pcu$  incidentally fuse with each other.

#### B. Evolutionary processes of hind wing venation and phylogeny

##### X. Subfamily *Chlamisinae*

The hind wing venation of this subfamily is comparatively stable but the following two parts are somewhat variable intergenerically.

1. a.  $Rc$  is complete
- b.  $Rc$  is incomplete by the absence of  $r$ -crossvein
2. a.  $Cu_{1b}$  forks into two subbranches and forms  $2Cuc$
- b. The two subbranches of  $Cu_{1b}$  secondarily fuse completely with each other and, therefore,  $2Cuc$  is not formed

The characteristics possessed by the members of this subfamily are shown as below:

1a+2a: *Carcinobaena*

1a+2b: *Chlamisus laticollis*

1b+2a: *Chlamisus hirta*, *C. consperba*, *Fulcidax*, *Diaplacaspis*

1b+2b: *Chlamisus pilota*, *Hymetes*

The genus *Chlamisus* has considerable interspecific variations. If the differentiation of the hind wing venation in this subfamily evolved from a complex type to a simple one as supposed in the more primitive subfamilies (Suzuki, 1969a, b, c), the differentiation of above two parts may also evolved from a to

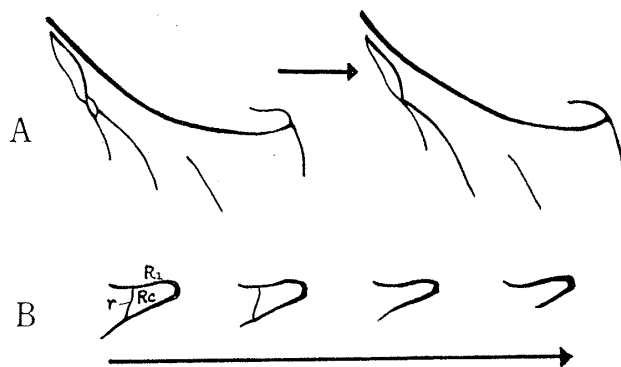


Fig. 4. Supposed evolutionary processes of hind wing venation of *Chlamisinae*.

A. Vannal region; B. Apical part of  $R_1$ .

b. However, the differentiation of the above two parts may be independent. The genus *Carcinobaena* has the most primitive feature (1a+2a), but their distribution is limited to the Neotropical Region. And the range of each of

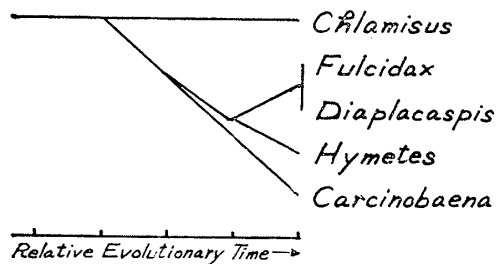


Fig. 5. Cladogram of *Chlamisinae* (at the genus level).

the genera *Fulcidax*, *Diaplacaspis* and *Hymetes*, is also confined in the Nearctic or Neotropical Regions. Among the groups treated in this paper, only the genus *Chlamisus* has the cosmopolitan range. So the author supposes that the genus *Chlamisus* is the most primitive group of this subfamily, the genus *Carcinobaena* may have been derived from an ancestor of the genus *Chlamisus*. The genera *Fulcidax* and *Diaplacaspis* are very similar to each

other in the hind wing venations, and, together with the genus *Hymetes*, they may have been differentiated from a certain ancestral group of *Carcinobaena* on the way of differentiation of *Carcinobaena*.

The results of above mentioned discussions may be arranged as in Figs. 4 and 5.

#### XI. Subfamily *Lamprosominae*

This subfamily is divided into two tribes, *Lamprosomini* and *Sphaerocharini*. The hind wing venation of this subfamily shows remarkable intergeneric variability. The hind wing venation of *Lamprosomini*, except the genus *Oomorphus* which has the exceedingly reduced venation all over, shows the characteristics that a miniature longitudinal branch named "unstable vein" (for example, see Chûjô, 1958) is issued from the middle part of the crossvein ( $cu_{1a}-cu_{1b}$ ), and that *Pcu* nearly reaches to the wing margin. On the contrary, in *Sphaerocharini*, the crossvein  $cu_{1a}-cu_{1b}$  is absent and the visible basal extremity of  $Cu_{1a}$  attaches to the antero-distal corner of  $2Cuc$  which is formed by the branching of  $Cu_{1b}$ ,

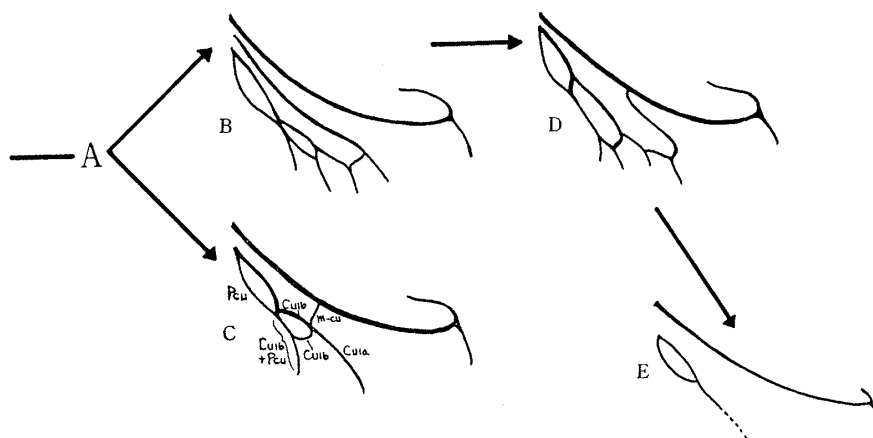


Fig. 6. Supposed evolutionary processes of *Lamprosominae*.  
 A. Hypothetical ancestor of *Lamprosominae*; B. *Lamprosoma* &  
*Lychnophaes*; C. *Sphaerocharis*; D. *Oomorphoides*; E. *Oomorphus*.  
 A and C were redrawn, partly revised, after Jolivet (1957).

*m-cu* combines  $M_{3+4}$  to  $Cu_{1a}$ , and, moreover, the apical half of *Pcu* seems to be fused with  $Cu_{1b}$ . The genera *Lamprosoma* and *Lychnophaes* belonging to *Lamprosomini* have almost the same structure of their hind wing venation but differ from the others by following aspects, *i. e.*, the visible basal extremity of  $Cu_{1a}$  reaches near the base of  $M_{3+4}$  but the *m-cu* is absent. In the genus *Sphaerocharis* belonging to *Sphaerocharini*,  $Cu_{1a}$  fuses with  $M_{3+4}$  by *m-cu*.  $Cu_{1a}$ , together with  $Cu_{1b}$ , is derived originally from the base of wing (Suzuki, 1969 a), and so far as the  $Cu_{1a}$  is concerned, this subfamily has the primitive feature as compared with the allied subfamilies. But, in the genus *Oomorphoides* the basal half of  $Cu_{1a}$  is reduced and the visible basal extremity fuses with  $M_{3+4}$  at the point about 2/5 from the base of the latter.

The phylogenetic relationship between the genera *Lamprosoma* and *Lychnophaes* can not be supposed after the knowledge of their hind wing venation but these two genera are the most primitive groups in the tribe *Lamprosomini* without doubt. The fact that the remarkable difference of the hind wing venation exists between the tribes *Sphaerocharini* and *Lamprosomini* strongly suggests that the two tribes are monophyletic. The genus *Oomorphoides* may have been derived from the *Lamprosoma*+*Lychnophaes* type ancestor judging from the position of the (visible) basal extremity of  $Cu_{1a}$ . The genus *Oomorphus* is very similar to the genus *Oomorphoides* in their adult external characters and may have been derived from a certain ancestral groups of the genus *Oomorphoides* on the way of differentiation of the genus *Oomorphoides*.

The results of above mentioned discussions may be arranged in Figs. 6 and 7.

## XII. Subfamily *Eumolpinae*

Clavareau (1914) classified this subfamily into twenty-six tribes and Chûjô (1956) changed names of some of them. The tribes treated in this paper are as

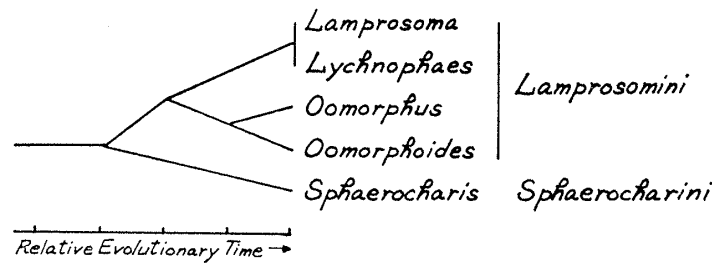


Fig. 7. Cladogram of *Lamprosominae* (at the tribe and genus levels).

follows (genus names indicated by asterisks show those of which the hind wing venations were studied by Jolivet, 1957).

1. Tribe *Euryopini* Clavareau, 1914  
\**Eumolpopsis*
2. Tribe *Adoxini* Jacoby, 1908  
*Bromius*
3. Tribe *Chrysodini* Clavareau, 1914  
\**Chalcoplacis*, \**Phaedrias*, \**Spintherophyta*, \**Lamprosphaetus*, \**Chalcophyma*, \**Plastonothus*
4. Tribe *Iphimeini* Jacoby, 1908  
\**Agrianes*, \**Euphytus*, \**Iphimoides*, \**Clisithera*, \**Agbalus*, \**Hylax*, \**Iphimeis*, \**Teaspes*, \**Chrysolampra*, \**Terillus*, \**Eurysarcus*, \**Cuytiera*, \**Lepronota*, \**Choris*, \**Nodonota*, \**Alittus*
5. Tribe *Colaspini* Jacoby, 1908  
\**Epiphyma*, \**Aracyntha*, \**Metaxyonycha*, \**Dermorrhytis*, \**Adorea*, \**Stenolampra*, \**Entomoschirus*, \**Promecosoma*, \**Geloptera*, \**Rhabdopterus*, \**Lepronida*, \**Podoxenus*, \**Agetinus*, \**Alethaxius*, \**Campylochira*, \**Dematochroma*, \**Hypoderes*, \**Colaspis*, \**Hermesia*, \**Prionodera*, \**Eupales*
6. Tribe *Chalcophanini* Clavareau, 1914  
\**Otilea*, \**Steuneurus*, \**Corysthea*, \**Chalcophana*
7. Tribe *Basileptini* Chûjô, 1956 (= *Nodostomini* Jacoby, 1908)  
*Basilepta*, *Nodina*
8. Tribe *Colposcelini* Chûjô, 1956 (= *Pagriini* Jacoby, 1908)  
*Colposcelis*
9. Tribe *Scelodontini* Jacoby, 1908  
*Scelodonta*
10. Tribe *Lypesthini* Chûjô, 1956 (= *Leprotini* Jacoby, 1908)  
*Lypesthes*, *Demotina*, *Hyperaxis*, \**Hemiplatys*
11. Tribe *Trichochryseini* Clavareau, 1914  
*Trichochrysea*
12. Tribe *Eumolpini* Jacoby, 1908  
\**Eumolpus*, *Colasposoma*
13. Tribe *Cynoini* Clavareau, 1914  
\**Pseudostola*
14. Tribe *Edusellini* Clavareau, 1914

- \**Arsoa*, \**Tymnes*
15. Tribe *Myochroini* Jacoby, 1908  
\**Acrothinium*, \**Mecistes*, \**Pachnephorus*, \**Dictyneis*
  16. Tribe *Typophorini* Jacoby, 1908  
\**Cleoporus*, \**Meniellus*, \**Typophorus*
  17. Tribe *Corynodini* Jacoby, 1908  
\**Platycorynus*
  18. Tribe *Endocephalini* Jacoby, 1908  
\**Thyra*, \**Colaspoides*

The hind wing venation of this subfamily is considerably variable especially in  $Cu_{1a}$ . The common characteristic of almost all members of this subfamily is in having two large  $Cuc$  ( $1Cuc$  and  $2Cuc$ ). But,  $Cu_{1a}$  is very variable not only intertribally but also intratribally. The author, therefore, can not suppose the archetype of this subfamily according to the characters of the hind wing venation only. It seems that the tendency of differentiation of the hind wing venation is characteristic to each tribe. Accordingly, the introduction of many other characters is needed to approach the phylogenetic consideration of this subfamily.

The author wishes, however, to attach importance to the position of the base of  $Cu_{1a}$ . In many tribes of this subfamily, the basal half of  $Cu_{1a}$  disappears and its visible basal extremity fuses with  $M_{3+4}$  at the position  $1/3$  to  $1/2$  from the base of the latter. But, on the contrary, in the genus *Eumolpopsis* the basal part of  $Cu_{1a}$  is better preserved. So the author supposes that the tribe *Euryopini* is the most primitive group of this subfamily and that the others

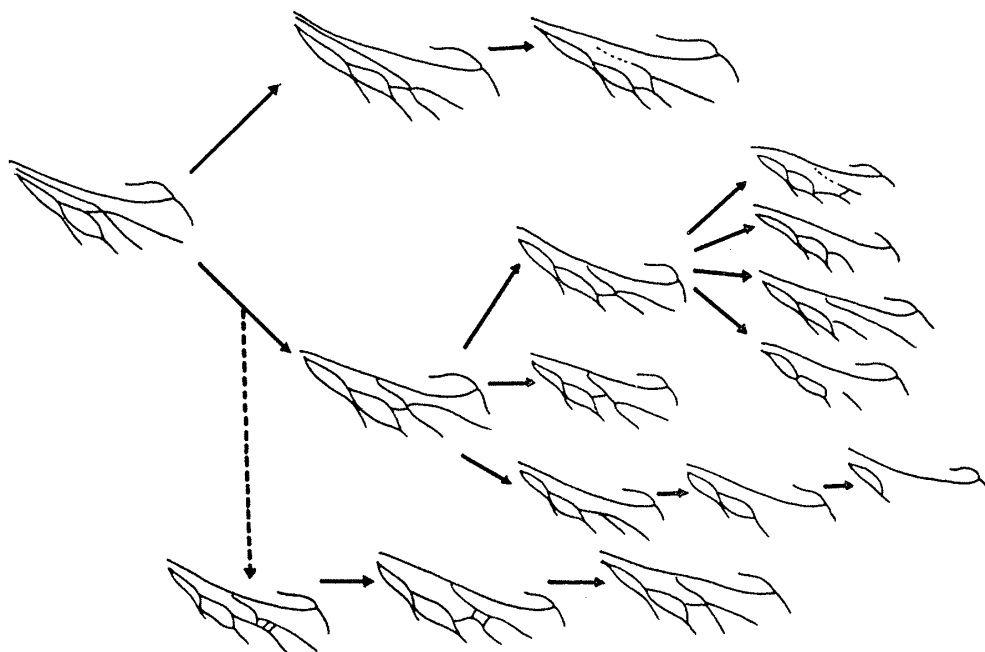


Fig. 8. Supposed evolutionary processes of *Eumolpinae*.



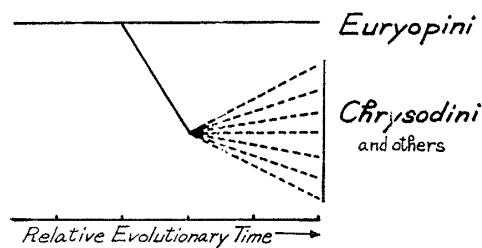


Fig. 9. Cladogram of *Eumolpinae* (at the tribe level).

may have been derived from the *Euryopini* type ancestor and excessively differentiated by adaptive radiation within comparatively short time. Though the hind wing venation of each tribe is very unstable, the author thinks that the hind wing venation of this subfamily differentiated from a complex type to a simple one as seen in many other subfamilies (Suzuki, 1969b, c).

The results of above mentioned discussions may be arranged as in Figs. 8 and 9.

### Summary

1. General structures of the hind wing venation of the following three subfamilies were described and illustrated: *Chlamisinae* (Fig. 1), *Lamprosominae* (Fig. 2) and *Eumolpinae* (Fig. 3).

2. Evolutionary process of the hind wing venation in each of these subfamilies was supposed and illustrated: *Chlamisinae* (Fig. 4), *Lamprosominae* (Fig. 6) and *Eumolpinae* (Fig. 8).

3. Phylogeny at the infrasubfamilial levels of these three subfamilies chiefly based on the comparative morphology of the hind wing venation was discussed and expressed in the cladogram: *Chlamisinae* (Fig. 5), *Lamprosominae* (Fig. 7) and *Eumolpinae* (Fig. 9).

4. In the three subfamilies treated in this paper the hind wing venation seems to have been evolved from a complex type to a simple one and the author's phylogenetic consideration was authenticated in this conclusion.

### Acknowledgements

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### Abbreviations used in the text and figures

*Cu*: Cubitus; *Cuc*: Cubital cell; *M*: Media; *Pcu*: Postcubitus; *R*: Radius; *Rc*: Radial cell; *cu<sub>1a</sub>-cu<sub>1b</sub>*, *cu<sub>1b</sub>-pcu*, *m-cu*, *m-m*, *r*, *r-m*: crossveins.

For details, see Suzuki (1969a).

## References

- Chen, S. H. (1940): Attempt at a new classification of the leaf beetles. *Sinensia*, 11 (5/6): 451-481, 30 figs.
- Chûjô, M. (1953): A taxonomic study on the Chrysomelidae from Formosa, VI. Lamprosominae. *Techn. Bull., Kagawa Agr. Coll.*, 4 (3): 237-249, 11 figs.
- (1955a): Ditto, IX. Chlamisinae 1. *Ibid.*, 7 (1): 51-59, figs. 1-12.
- (1955b): Ditto, IX. Chlamisinae 2. *Ibid.*, 7 (2): 153-167, figs. 13-25.
- (1956): Ditto, VIII. Eumolpinae. *Philip. Jour. Sci.*, 85 (1): 1-180, 14 figs.
- (1958): Chrysomelid-beetles of Japan, 1. Subfamily Lamprosominae. *Ent. Rev. Japan*, 9 (1): 51-58, Pls. 9-10. (in Japanese)
- Clavareau, H. (1914): *Coleopterorum Catalogus, auspiciis et auxilio W. Junk, editus a S. Schenkling, Pars 59: Chrysomelidae-Eumolpinae*. 215 pp., Berlin.
- Crowson, R. A. (1955): *The Natural Classification of the Families of Coleoptera*. 187 pp., Nathaniel Lloyd, London.
- Gressitt, J. L. (1942): Plant-beetles from south and west China, I. Sagrinae, Donaciinae, Orsodacninae and Megascalinae. *Lingnan Sci. Jour.*, 20 (2/4): 271-293, Pls. xi-xiv.
- Jacoby, M. (1908): *Fauna of British India, including Ceylon and Burma, Coleoptera II. Chrysomelidae I.*, xx+534 pp., 172 figs., Pls. I-II, London.
- Jolivet, P. (1957): *Recherches sur l'aile des Chrysomeloidea (Coleoptera). Première partie*, Mèm. Inst. Sci. nat. Belg., Brussels (2) fasc 51: 1-180, Figs. 1-11, Pls. I-XX.
- Lacordaire, M. T. & F. Chapuis (1874-5): *Histoire Naturelle des Insectes. Genera des Coléoptères ou Exposé méthodique et critique de tous les Genres proposés juscu'ici dans cet Ordre d'Insectes*. Paris, Tome X, 455 pp. (cited after Chen, 1940).
- Suzuki, K. (1969a): Comparative morphology and evolution of the hind wings of the family Chrysomelidae (Coleoptera), I. Homology and nomenclature of the wing venation in relation to the allied families. *Kontyû*, 37 (1): 32-40, 6 figs.
- (1969b): Ditto, II. Subfamilies Orsodacninae, Sagrinae, Zeugophorinae, Megalopodinae, Donaciinae and Criocerinae. *Ent. Rev. Japan*, 22 (1): 33-45, 14 figs.
- (1969c): Ditto, III. Subfamilies Megascalinae, Clytrinae and Cryptocephalinae. *Kontyû*, 37 (4): 359-366, 7 figs.