SUMMARY
SUMMARY

The present studies relate to taxonomy of Indian Alcidodinae (Curculionidae; Coleoptera). The manuscript has been divided into several chapters viz., Nomenclature of subfamily Alcidodinae; Introduction; Material, Technique and Procedure of Study; Observations; Photographs and Figures; General Conclusions and Scope for Further Study; Summary; Bibliography; Abbreviations. The salient features of various chapters are summed up in the following pages.

I. Nomenclature of subfamily Alcidodinae

This subfamily has undergone several changes of nomenclature. It was for a long time referred to as Alcidinae after the name of its basic genus Alcides Schoenh. The preoccupation of the generic name Alcides under order Lepidoptera led Marshall (1939) to modify it as Alcidodes. Voss, however, preferred to use the name Mecyllobinae for this subfamily after the next available generic name Mecyllobius Heitt. following the rule of priority. The author has followed the general trend in adopting Alcidodinae as the subfamily name.
II. Introduction

The subfamily Aleidocinae is one of the important groups of family Curculionidae. It includes medium-sized black coloured curculionids having bilobed elytra covering the base of pronotum, and appendiculate claws. The aleidodes are of great economic importance because their larvae and adults are associated as pests with several crops. However, the group has received very little attention in India as only 72 species have so far been recorded from this country. The entire literature pertaining to the Indian fauna as well as important works on the revision of taxa and the faunal treatments of other regions have been recorded. The perusal of literature reveals that the validity of the recently proposed genera and subgenera has not been tested on Indian material for the most rigid task of splitting the only genus established under the subfamily. Moreover, the aleidodid fauna of India has been mostly sampled and studied by workers from abroad and the type material of most of the species is in the European Museums. All these facts warrant fresh sampling and detailed studies on the group. Accordingly, material collected over a period of five years together with some received on loan from different museums has been studied. The identity of species has been confirmed with
the help of relevant literature and most of them have been compared with the collections in the various European Museums by the author's supervisor.

Apart from the need to collect additional species and updating their taxonomic status, a particular attention needs to be paid to the structure of male and female genitalia which has not been thoroughly studied in the Indian material. A brief review of the literature pertaining to the study of genitalia in Alcidiinae and other subfamilies of Curculionidae is given, followed by reference to the relevant works dealing with other families of Curculionoidea, general Coleoptera and Insecta.

This subfamily is exclusive among the subfamilies of Curculionidae in being represented by a single genus and its revision already overdue. In this connection, the works of the important workers such as Heller, Voss and Haaf have been reviewed. The genera and subgenera so far proposed but not universally accepted have been thoroughly analysed for the division of the genus Alcides Muhl. As a result, three known groups of generic rank viz., Alcides Muhl., Mevalobus Heitt., Mesalcidodes Voss have been recharacterized and four new genera proposed. The observations of the earlier workers
have been applied on 73 Indian species to give them further support. The present investigations accordingly include 73 species under 7 genera. The studied species include 10 new species, 2 first records and 61 already known species.

III. Material, Technique and Procedure of Study

The material for the present studies was largely collected under a US FL 480 project in force in the Department of Zoology, Panjab University, Chandigarh, from 1976 to 1981. Some material was loaned from the museum of Forest Research Institute, Dehra Dun; Agricultural University, Bangalore; University of Delhi, Delhi and British Museum (N.H.), London.

The genitalia were extracted from the dead or freshly killed weevils, treated with 10% KOH, dehydrated and mounted in Canada Balsam. The figures of the genitalia were outlined under a trisimplex projector.

The procedure followed for taxonomic treatment in the present study is given in detail. A few taxonomic characters likely to be misinterpreted have been explained. The keys to the known species have been followed from the works of Haaf (1961a, 1964a). The contributions of Haaf (1961a, 1964b), Voss (1953, 1956, 1957, 1958, 1962a) and Heller (1917) have been consulted for the division of the large genus Alcidodes. The different terms used by
various workers for describing different parts of male genitalia have been tabulated. The terminology followed in this study has been largely taken from Rajni and Bhaveja (1973). In the case of female genitalia and the spermatheca, terminology proposed by Souder (1963) and Speet and Lewitt (1926) is employed.

IV. Observations

The taxonomic treatment starts with an account of the general characters of the subfamily followed by keys to the lower taxa and their characteristic features. The descriptions of genera and species start with the list of synonyms. The descriptions of the already known as well as new species have been recorded in detail, with suitable data on distribution, type depository and host plant etc. The new taxa have been named and type-species designations given. Remarks on the taxonomic relationship of different genera and species have been recorded. A list of 73 species along with their taxonomic status in the present studies is given below:

Genus Brahmaclidodes gen. nov.
1. Brahmaclidodes microcrinhus (Pasc.)
2. B. micromicronychus sp. nov.

Genus Necvalebus Reitt.
3. Necvalebus (Indonecvalbus) montanus (Haaf)
4. Neocyclus (Indocyclus) sicca (Haaf)
5. N. (L.) reticulatus (F.)
6. N. (L.) delicatulus (Haaf)
7. N. (L.) assamensis sp. nov.
8. Neocyclus (Neocyclus) trigonophorus (Mahl.)
9. N. (M.) fasciatus (Hedt.)
10. N. (M.) westerwoudi (Boh.)
11. N. (M.) artivittus (Mahl.)
12. N. (M.) scopicus (Fst.)

Genus Neocyclus gen. nov.

13. Neocyclus fasciatus (Fst.)
14. N. correctirostris (Mahl.)
15. N. loreta (Mahl.)
16. N. audax (Hedl.)
17. N. habenatus (Mahl.)
18. N. vinculosus (Hedl.)
19. N. impressus (Hedl.)
20. N. aquamorus sp. nov.
21. N. saturnus (Haaf)
22. N. mellitus (Fst.)
23. N. stroblanthesia sp. nov.
24. N. gardneri sp. nov.

Genus Tuberculocyclus gen. nov.

25. Tuberculocyclus auctus (Fst.)
26. T. oberthuri (Fasc.)
27. *Tuberculomycylobus crinalifer* (Mahl.)
28. *I. profusus* (Haaf)
29. *I. comparabilis* (Bovie)
30. *I. taeniatus* (Hell.)

Genus *Cylindricaloides* Hell.

31. *Cylindricaloides hubo* (F.)
32. *C. corniculus* (Fst.)
33. *C. barbaricus* (Haaf)
34. *C. waldi* (Mahl.)
35. *C. bicolorus* sp. nov.
36. *C. saunderi* (Pasc.)
37. *C. major* (Haaf)
38. *C. frentius* (Fst.)
39. *C. obsesus* (Fst.)
40. *C. affabre* (Auri.)
41. *C. mysticus* (Fst.)
42. *C. tutus* (Fst.)
43. *C. judicator* (Fst.)
44. *C. desoptus* (Haaf)
45. *C. semculus* (Fst.)
46. *C. suvacnae* sp. nov.
47. *C. vafellus* (Fst.)
48. *C. alveanae* sp. nov.
49. *C. fervidus* (Haaf)
50. *C. separandus* (Haaf)
Genus *Mesaloidodes* Voss

51. *Mesaloidodes* (Ornamentaloides) *leopardus* (Ol.)
52. *Mesaloidodes* (*Mesaloidodes*) *vitalis* (Mahl.)
53. *M.* (M.) *stevensii* (Mahl.)
54. *M.* (M.) *fusco-cupreus* sp. nov.
55. *M.* (M.) *hypocritus* (Boh.)
56. *M.* (M.) *satelles* (Fst.)
57. *M.* (M.) *improvidus* (Fst.)
58. *Mesaloidodes* (*Pseudomesaloidodes*) *pectoralis* (Boh.)
59. *M.* (P.) *bolitii* (Boh.)
60. *M.* (P.) *nocens* (Hell.)
61. *M.* (P.) *serotinus* (Haaf)
62. *M.* (P.) *anamalaiaisensis* sp. nov.

Genus *Alcidodes* Mahl.

63. *Alcidodes* * instructus* (F.
64. *A.* *sigmatus* Boh.
65. *A.* *fusca* (Fst.
66. *A.* *collaria* Pasc.
67. *A.* *diterocarni* Mahl.
68. *A.* *crassus* Pasc.
69. *A.* *fabricii* (F.
70. *A.* *rectus* Haaf
71. *A.* *morio* Hell.
72. *A.* *discrepans* Fst.
73. *A.* *molitor* Hell.
V. General Conclusions and Scope for Further Study

Out of a total of 72 species under a single genus known from India, 61 species under 7 genera have been included in the present study. The splitting of the single genus Aleidodes and the assignment of the old and new species under relevant subgeneric and generic groups, has been one of the important objectives of this study. The 7 proposed genera include three already established generic names viz., *Megalobula* Keit., *Megaleidodes* Voss and *Aleidodes* Mahl., one so far suggested subgenus *Cylindraleidodes* Hell., and three new genera viz., *Hybridaleidodes*, *Neomegalobula* and *Tuberculomegalobula*. In addition, 10 new species have been reported, and 2 species have been recorded for the first time.

The structure of male and female genitalia has provided useful characters for discriminating various taxa, though to a limited extent. It has been observed that the shape and apex of aedeagus, the length of aedeagal and phallobasic apodemes, endophallic armature, presence or absence of parameres in male genitalia; and shape of coxites, presence or absence of styli and the structure of spermatheca in the female genitalia provide useful taxonomic characters.

Despite satisfactory contribution to Indian *Aleidodinae*, additional sampling is called for in the
poorly surveyed areas of the country to discover more new forms along with the supplementation of already described species. Further studies on additional material are necessary for the verification of opinions expressed herein on the basis of available material.