

CHROMOSOME NUMBERS IN INDIAN COLEOPTERA

By

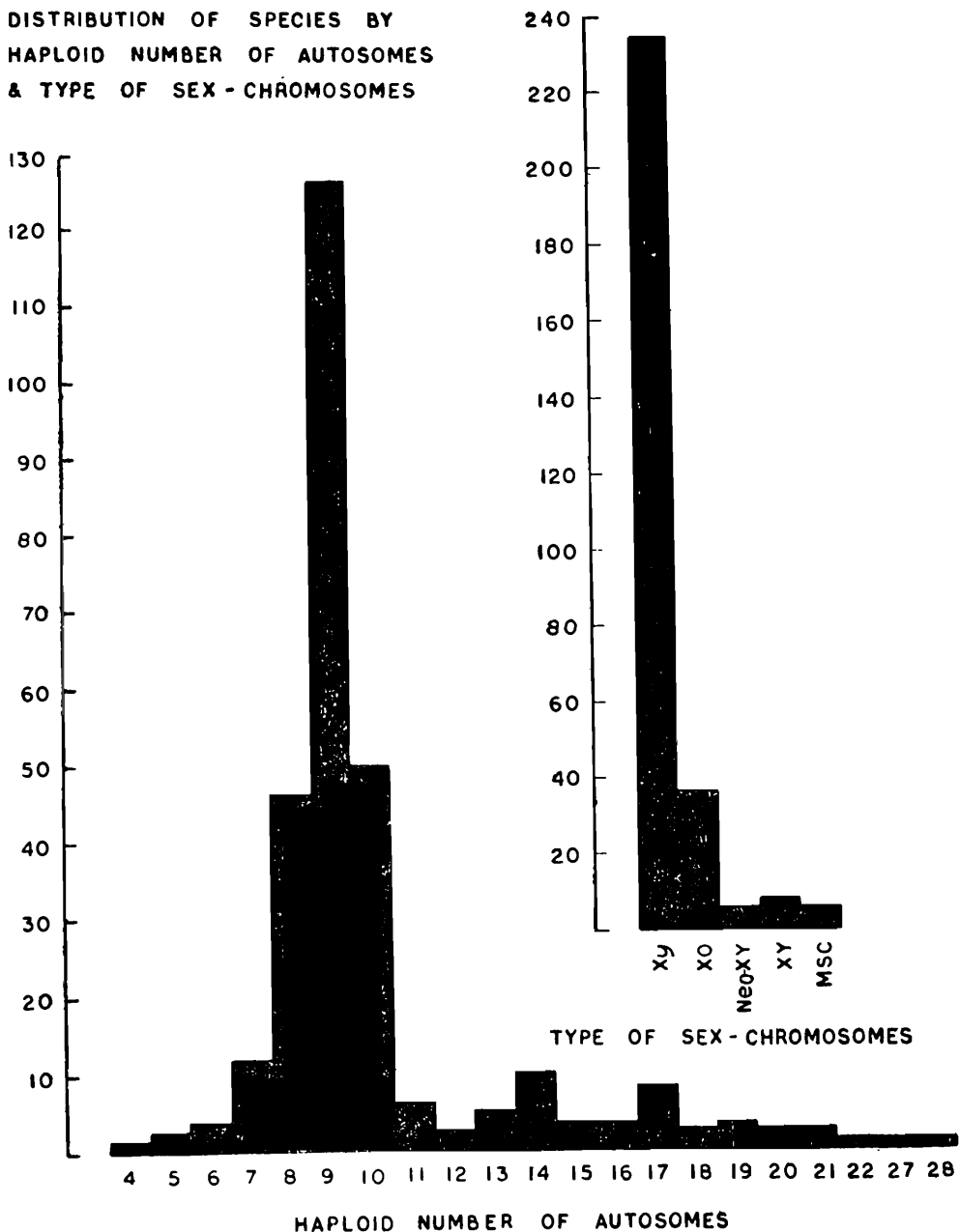
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(With 1 Text-figure)

INTRODUCTION

The need of comprehensive and upto-date list of the chromosome numbers of Coleoptera was realised by Smith (1953), who provided a valuable list to coleopteran cytologists from the published literature. In 1960, Smith added about 472 species and about 178 genera.



Text-fig. 1

The aim of this compilation is to document the chromosome numbers of only Indian Coleoptera which will be of considerable value to the cytologists and cytotaxonomists working on Indian material. Efforts have been made to incorporate all the available chromosome information of Coleoptera whether published or otherwise.

The total number of Indian Coleoptera known chromosomally stands approximately 289 species of 146 genera under 19 families.

As far as possible the genera have been arranged phylogenetically as given in *Coleopterorum Catalogus*, *Fauna of British India* and *Leng's Catalogue* (1920), whereas species have been arranged in alphabetical order. Families have been arranged according to Crowson (1960).

The name of the species is followed by the sex of the species studied and the diploid chromosome number. The sex chromosomes in males have been indicated in symbols; 'XY' which symbolises indistinguishable sex chromosomes, 'Xyp' and 'Xyr' indicate comparatively smaller 'y' chromosome and its association in meiotic metaphase with the 'X' is either like parachute (p) or end to end (r) respectively. The 'Xy' symbol indicates where association between the sex chromosomes is not known. 'Neo-XY' is a derivative form. 'XXy' and 'Xyy' are multiples of 'X' and 'y' respectively. 'XO' symbol is used where 'y' chromosome is absent.

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TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
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ADEPHAGA : CARABOIDEA

1. CICINDELIDAE

CICINDELINI

<i>Cicindela catena</i> Fabricius	♂ 23	XXY	Dasgupta, 1967
[<i>6-punctata</i> Fabricius]	♂ 23	XXy	Joneja, 1960

2. CARABIDAE

Subfamily CARABINAE

CARABINI

<i>Calosoma orientale</i> Hope	♂ 27	XO	Dasgupta and Chakrabarti, 1972a, 1973
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SCARITINI

<i>Scarites indus</i> Olivier	♂ 15	XO	Dasgupta and Chakrabarti 1972a, 1973
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Subfamily HARPALINAE

CHLAENIINI

<i>Chlaenius neelgheriensis</i> Guerin	♂ 35	XO	Dasgupta and Chakrabarti, 1972a, 1973
<i>C. pangagaeoides</i> Chaudoir	♂ 35	XO	Agarwal, 1969a, f
<i>C. xanthopilus</i> (Wiedemann)	♂ 34	Xyp	Lahiri and Manna, 1969
<i>Anoplogenius microgonus</i> Bates	♂ 38	Xyp	Manna and Lahiri, 1972

HARPALINI

<i>Harpalus indicola</i> Bates	♂ 37	XO	Dasgupta and Chakrabarti, 1972a, 1973
<i>Bradybaenus festivus</i> Dejean	♂ 37	XO	Joneja, 1960
	♂ 36	XY	Dasgupta and Chakrabarti, 1972a, 1973

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
PANAGAEINI			
<i>Caspedophorus angulatus</i> Fabricius	♂ 12	XY	Dasgupta and Chakrabarti, 1972a, 1973
BRACHININI			
<i>Pheropsophus bimaculatus</i> (Linnaeus)	♂ 35	XO	Agarwal, 1960b
<i>P. catoirei</i> Dejean	♂ 35	XO	Joneja, 1960, Agarwal, 1962
	♂ 27	XO	Dasgupta and Chakrabarti, 1972a, 1973
<i>P. occipitalis</i> Macleay	♂ 36	"XY"	Joneja, 1960
ANTHINI			
<i>Anthia sexguttata</i> (Fabricius)	♂ 35	XO	Asana, <i>et al.</i> , 1942.

3. DYTISCIDAE

Subfamily HYDATICINAE

HYDATICINI

Hydaticus fabricii ♂ 41 XO Joneja, 1960
Macleay

H. leander Rossi ♂ 45 XO Joneja, 1960

ERETINI

Eretes sticticus ♂ 41 XO Joneja, 1960
(Linnaeus)

Subfamily CYBISTRINAE

Cybister limbatus ♂ 43 XO Dasgupta, 1963
Fabricius

POLYPHAGA : HYDROPHILOIDEA

4. HYDROPHILIDAE

Subfamily HYDROPHILINAE

HYDROPHILINI

Sternolophus rufipes ♂ ♀ 18 Xyp :
Fabricius XX Agarwal, 1960a.

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>Hydrophilus indicus</i> Bedel	♂ 30	Xyp	Manna and Lahiri, 1972
<i>Hydrous acuminatus</i> Motschulsky	♂ 30	Xy	Asana <i>et al.</i> , 1942
<i>H. indicus</i> Bedel	♂ 30	Xyp	Agarwal, 1960a
BEROSINI			
<i>Berosus indicus</i> Motschulsky	♂ 18	Xyp	Agarwal, 1960a, c
STAPHYLINOIDEA			
5. STAPHYLINIDAE			
Subfamily STAPHYLININAE			
XANTHOLININI			
<i>Platyprosopus</i> <i>tamulus</i> Erjchson ¹	♂ 20	Xy	Yadav and Pillai, 1975a
SCARABAEOIDEA			
6. SCARABAEIDAE			
Subfamily COPRINAE			
SCARABAEINI			
<i>Gymnopleurus cyaneus</i> (Fabricius)	♂ 20	Xyp	Kacker, 1976
<i>G. koenigi</i> (Fabricius)	♂ 20	Xyp	Dasgupta, 1963
<i>G. sinuatus</i> (Olivier)	♂ 18	Xyp	Manna and Lahiri, 1972
COPRINI			
<i>Catharsius molossus</i> (Linnaeus)	♂ 20	Xyp	Joneja, 1960, Manna and Lahiri, 1972
<i>C. pithecius</i> (Fabricius)	♂ 20	Xy	Kacker, 1970
	♂ 20	Xyp	Joneja, 1960, Manna and Lahiri, 1972
<i>C. sagax</i> (Quens)	♂ 20	Xy	Dasgupta, 1974
	♂ 20	Xyp	Manna and Lahiri, 1972
<i>Catharsius</i> sp. (near <i>sagax</i>)	♂ 20	Xyp	Manna and Lahiri, 1972

1. *Platyprosopus* = *Elatyprosophus* (Yadav and Pillai 1975a)

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>Catharsius</i> sp.	♂ 20	Xyr	Joneja, 1960
<i>Catharsius</i> sp.	♂ 20	Xyp	Saha and Manna, 1971
<i>Orphnus mysoriensis</i> Westwood	♂ 20	Xyp	Manna and Lahiri, 1972
<i>Heliocopris bucephalus</i> (Fabricius)	♂ 20	Xy	Manna and Lahiri, 1972
<i>Copris fricator</i> Fabricius	♂ 21	XO	Joneja, 1960
<i>Copris</i> sp.	♂ 14	Xyp	Manna and Lahiri, 1972
<i>Onthophagus bonasus</i> (Fabricius)	♂ 20	Xyr	Joneja, 1960
<i>O. catta</i> (Fabricius)	♂ 20	Xyr	Joneja, 1960
	♂ 20	Xyp or Xyr	Kacker, 1970
	♂ 20	Xyp	Manna and Lahiri, 1972
	♂ 20	Xy	Dasgupta, 1974
<i>O. dama</i> (Fabricius)	♂ 20	Xyr	Kacker, 1970
<i>O. mopsus</i> (Fabricius) (Longhorned phase, <i>gracilicornis</i> Germar)	♂ 20	Xyp	Manna and Lahiri, 1972
<i>O. remosellus</i> Bates	♂ 20	Xyp	Manna and Lahiri, 1972
<i>Onthophagus</i> sp. I	♂ 20	Xyp	Manna and Lahiri, 1972
<i>Onthophagus</i> sp. II	♂ 20	Xyp	Manna and Lahiri, 1972
<i>Onthophagus</i> sp. III	♂ 18	Xyp	Manna and Lahiri, 1972
<i>Onthophagus</i> sp. IV	♂ 18	Xyp	Manna and Lahiri, 1972
<i>Onitis philemon</i> Fabricius	♂ 20	Xyp	Joneja, 1960
Subfamily APHODIINAE			
APHODINI			
<i>Aphodius moestus</i> Fabricius	♂ 22	Xyp	Yadav, 1973b

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
Subfamily HYBOSORINAE			
<i>Hybosorus orientalis</i> Westwood	♂ 20 ♂ 19	Xyp XO	Kacker, 1970 Dasgupta, 1974
Subfamily TROGINAE			
<i>Trox granulatus</i> Herbst	♂ 20	Xyp	Dasgupta, 1974
<i>T. omacanthus</i> Harold	♂ 20	Xy	Yadav and Pillai, 1976c
<i>Trox</i> sp.	♂ 20	Xyp	Yadav and Pillai, 1974c
Subfamily MELOLONTHINAE			
<i>Apogonia nigricans</i> Hope	♂ 20 ♂ 19	Xyp XO	Kacker, 1970 Manna and Lahiri, 1972
<i>Apogonia</i> sp. nr. <i>nigricans</i> Hope	♂ 19	XO	Dasgupta, 1974
<i>Apogonia unistriata</i> Brenske	♂ 20	Xy	Lahiri and Manna, 1969
<i>Apogonia</i> sp.	♂ 20	Xyp	Lahiri and Manna, 1969
<i>Apogonia</i> sp.	♂ 21	XO	Saha and Manna, 1971 ; Saha, 1973
<i>Apogonia</i> sp.	♂ 19	XO	Yadav and Pillai, 1974c
<i>Schizonycha</i> <i>fuscescens</i> Be	♂ 20	Xyp	Manna and Lahiri, 1972
<i>S. ruficollis</i>	♂ 20	Xyp Xy	Yadav and Pillai, 1974c Dasgupta, 1974
<i>Autoserica</i> <i>assamensis</i> Brenske	♂ 30	Xy	Dasgupta, 1974
<i>A. insanabilis</i> Brenske	♂ 20	Xyp	Dua and Kacker, Unpub
<i>Autoserica</i> sp.	♂ 20	Xyr	Joneja, 1960
<i>Autoserica</i> sp.	♂ 18	Xy	Dua and Kacker, 1976a
<i>Holotrichia longipennis</i> Blanchard	♂ 18	Xyp	Dua and Kacker, 1976a
<i>Cephaloserica</i> <i>thompsoni</i> Brst.	♂ 19	XO	Yadav and Pillai, 1974c
<i>Cephaloserica</i> sp.	♂ 19	XO	Dua and Kacker, Unpub

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
Subfamily RUTELINAE			
ANOMALINI			
<i>Mimela</i> sp.	♂ 20	Xyp	Joneja, 1960
<i>Anomala bengalensis</i> Blanchard	♂ 18	Xy	Saha and Manna, 1971 ; Saha, 1973
<i>A. dorsalis</i> Fabricius	♂ 20	Xyp	Agarwal, 1960a, 1962 ; Pillai and Yadav, 1975, Yadav and Pillai, 1975c
<i>A. lineatopennis</i> Blanchard	♂ 20	Xyp	Dua and Kacker, Unpub
<i>A. polita</i> Blanchard	♂ 20	Xyp	Yadav and Pillai, 1974c, 1975c, Pillai and Yadav, 1975
<i>A. ruficapilla</i> Burmeister	♂ 20	Xyp	Kacker, 1970 Yadav and Pillai, 1974c, 1975c ; Pillai and Yadav, 1975.
<i>A. superflua</i> Arrow	♂ 20	Xyp	Joneja, 1960
<i>A. varicolor</i> (Gyllenhal)	♂ 20	Xyp	Pillai and Yadav, 1975
<i>A. vestigator</i> Arrow	♂ 20	Xy	Yadav and Pillai, 1975c
<i>Anomola</i> sp., nr, <i>bilobata</i> Arrow	♂ 20	Xyp	Pillai and Yadav, 1975, Yadav and Pillai, 1975c
<i>Anomola</i> sp.	♂ 20	Xy	Lahiri and Manna, 1969
<i>Anomola</i> sp.	♂ 20	Xyp	Kacker, 1970
<i>Anomola</i> sp.	♂ 20	Xyp	Manna and Lahiri, 1972
<i>Anomola</i> sp.	♂ 18, 20, 22	Xyp or Xy	Dua and Kacker, 1976a
ADORRHINYPTIINI			
<i>Adorrhinyptia</i>			
<i>dorsalis</i> (Burmeister)	♂ 22	Xyp	Yadav and Pillai, 1975b, 1976b
<i>Adorrhinyptia</i> sp.	♂ 16, 18, 20	Xyr	Saha and Manna, 1971, Saha, 1973
ADORETINI			
<i>Adoretus decanus</i> Dhatus	♂ 22	Xyp	Yadav and Pillai, 1975b, 1976b

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>A. duvauceli</i> Blanchard	♂ 22	Xyp	Yadav and Pillai, 1975b, 1976b
<i>A. incurvatus</i> Dhaus	♂ 22	Xyp	Yadav and Pillai, 1975b, 1976b
<i>A. lasiopygus</i> Burmeister	♂ 22	Xyp	Yadav and Pillai, 1975b, 1976b
<i>A. limbatus</i> Blanchard	♂ 22	Xyp	Yadav and Pillai, 1975b, 1976b
<i>A. verustus</i> Harold	♂ 22	Xyp	Kacker, 1970, Yadav and Pillai, 1975b, 1976b
<i>Adoretus</i> sp.	♂ 22	Xyp	Joneja, 1960
<i>Adoretus</i> sp.	♂ 22	Xyp	Yadav and Pillai, 1974c
<i>Adoretus</i> sp.	♂ 22	Xyp	Yadav and Pillai, 1975b
<i>Adoretus</i> sp.	♂ 22	Xyp	Yadav and Pillai, 1976b
<i>Adoretus</i> sp.	♂ 22	Xyp	Dua and Kacker, Unpub
Subfamily DYNASTINAE			
<i>Oryctes rhinoceros</i> (Linnaeus)	♂ 20	Xy	Dasgupta, 1974
<i>Pentodon</i> <i>bispiniiformis</i> Reitter	♂ 20	Xyp	Joneja, 1960
<i>Pentodon</i> sp.	♂ 19	XO	Joneja, 1960
Subfamily CHIRONINAE			
<i>Chiron digitatus</i> (Fabricius)	♂ 20	Xy	Kacker, 1970
BUPRESTOIDEA			
7. BUPRESTIDAE			
JULODINI			
<i>Julodis whitthilli</i>	♂ 24	neo-XY	Asana <i>et al.</i> , 1942
<i>Sternocera laevigata</i>	♂ 26	neo-XY	Asana <i>et al.</i> , 1942
<i>S. nitidicollis</i>	♂ 26	neo-XY	Asana <i>et al.</i> , 1942
ELATEROIDEA			
8. ELATERIDAE			
Subfamily PYROPHORINAE			
PYROPHORINI			
<i>Agrypnus fuscipes</i> Fabricius	♂ 17	XO	Banerjee, 1959

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>A. serrula</i> (Candeze)	♂ 17	XO	Dua and Kacker, Unpub
<i>Agrypnus</i> sp.	♂ 11	XO	Kacker, 1963
<i>Agrypnus</i> sp.	♂ 17	XO	Dua and Kacker, Unpub
<i>Adelocera colonicus</i> (Candeze)	♂ 17	XO	Kacker, 1976
<i>A. modesta</i> Boisduval	♂ 17	XO	Joneja, 1960, 1964
<i>Adelocera</i> sp.	♂ 17	XO	Manna, and Lahiri, 1972
<i>Lacon</i> sp.	♂ 17	XO	Dua and Kacker, 1976a
<i>Heteroderes</i> <i>macroderus</i> Candeze	♂ 19	XO	Agarwal, 1960a, 1962
	♂ 17	XO	Manna and Lahiri, 1972
	♂ 34	XXO	Manna and Lahiri, 1972
Subfamily ELATERINAE			
MELALONTINI			
<i>Melanotus longicornis</i> Candeze	♂ 19	XO	Manna and Lahiri, 1972
<i>Melanotus</i> sp.	♂ 21	XO	Dua and Kacker, Unpub
CANTHAROIDEA			
9. CANTHARIDAE			
CANTHARINI			
<i>Cantharis tenuicollis</i> Pallas	♂ 20	Xyp	Yadav, 1973b
<i>Cantharis</i> sp.	♂ 20	Xyp	Yadav, 1973b
DERMESTOIDEA			
10. DERMESTIDAE			
Subfamily DERMESTINAE			
DERMESTINI			
<i>Dermestes maculatus</i> DeGeer	♂ 18	Xy + 1-3 sepernumerary y-chromosomes	Shaw, 1968
Subfamily ANTHRENINAE			
ANTHRENINI			
<i>Anthrenus fasciatus</i> Herbst	♂ 18	Xyp	Yadav, 1973b

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
BOSTRYCHOIDEA			
11. BOSTRYCHIDAE			
<i>Sinoxylon anale</i> Lesne	♂ 20+1 Supernumerary	Xyp	Manna and Lahiri, 1972
<i>Bostrychopsis</i> <i>bengalensis</i> (Lense)	♂ 20	Xyp	Manna and Lahiri, 1972
CUCUJOIDEA			
12. COCCINELLIDAE			
Subfamily COCCINELLINAE			
COCCIDULINI			
<i>Suminus</i> <i>cardoni</i> Weise	♂ 18	Xyp	Manna and Lahiri, 1972
CHILOCORINI			
<i>Chilocorus nigrinus</i> (Fabricius) ²	♂ 22	Xyp	Yadav and Pillai, 1974c
<i>Exochomus</i> <i>lituratus</i> Gorham	♂ 18+0 -4 Supernumerary	neo-Xy	Smith, 1965, 1966
<i>E. uropygialis</i> Mulsant	♂ 16		Smith 1965, 1966
<i>Brumus suturalis</i> (Fabricius)	♂ 18	neo-Xy	Yadav and Pillai, 1974c
SYNONYCHINI			
<i>Menonchilus</i> <i>sexmaculatus</i> (Fabricius)	♂ 20	Xyp	Agarwal, 1960a, Yadav and Pillai, 1974c
<i>Verania cardoni</i> Weise	♂ 20	Xyp	Yadav and Pillai, 1974c
<i>V. discolor</i> (Fabricius)	♂ 20 ♂ ♀ 20	Xyp Xyp : XX	Manna and Lahiri, 1972 Dua and Kacker, Unpub

2. *Chilocorus nigrinus*=*Braeti nigrinus* (Yadav and Pillai 1974c)

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
COCCINELLINI			
<i>Coccinella repanda</i> Thunberg	♂ ♀ 20	Xyp : XX	Agarwal, 1960a, 1961
<i>C. septempunctate</i> Linnaeus	♂ 10 ♂ 20	Xyp	Nath, <i>et al.</i> , 1951, Sharma <i>et al.</i> , 1959, Agarwal, 1960a, 1961, Manna and Lahiri, 1972
<i>C. transversalis</i> Fabricius	♂ 20 ♂ 20	Xy Xyp	Dua and Kacker, 1975, Manna and Lahiri, 1972
PSYLLOBORINI			
<i>Illeis cincta</i> (Fabricius)	♂ 20	Xyp	Yadav and Pillai, 1974c
<i>I. indica</i> Timberlake	♂ ♀ 20	Xyp : XX	Dua and Kacker, 1975
<i>Thea</i> <i>bisoctonotata</i> Mulsant	♂ 20	Xyp	Yadav and Pillai, 1974c
Subfamily EPILACHNINAE			
<i>Epilachna</i> <i>chrysomelina</i> <i>orientalis</i> Zimmermann ³	♂ ♀ 18	XY : XX	Agarwal, 1960a, 1961
<i>E. dodecastigma</i> (Wiedemann)	♂ 20	Xyp	Lahiri and Manna, 1969
	♂ 12, 14	Xyp	Saha and Manna, 1971
	♂ 14	Xyr	Saha, 1973
<i>E. septima</i> Dieke	♂ 20	Xyp	Kacker, 1973
<i>E. vigintioctopunctata</i> (Fabricius)	♂ 18	Xyp	Bose, 1948, Agarwal, 1961, Yadav and Pillai, 1974c Dua and Kacker, Unpub.
<i>Afissa parvula</i> (Crotch)	♂ 18	Xyp	Kacker, 1976
13. TENEBRIONIDAE			
Subfamily ERODIINAE			
<i>Spyrathus</i> sp.	♂ 20	Xyp	Yadav and Pillai, 1974c
<i>Spyrathus</i> sp. <i>affin</i> <i>maindroni</i> Vauloger	♂ 20	Xyp	Yadav and Pillai, 1974d

3. *Epilachna chrysomelina orientalis* = *Epilachna orientalis* (Agarwal, 1960a, 1961)

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
Subfamily EPITRAGINAE			
<i>Himatismus fasciculatus</i> Fabricius	♂ 20	Xyp	Dasgupta and Chakra- barti, 1973, Dasgupta, 1975
Subfamily TENTYRIINAE			
<i>Hyperops coromandelensis</i> Solier	♂ 20	Xyp	Dasgupta and Chakra- barti, 1973, Dasgupta, 1975
<i>Mesostena lineatop- unctata</i> Kraatz	♂ 20	Xyp	Yadav and Pillai, 1974, c, d
<i>Pachycera atre</i> Herbst	♂ 20	Xyp	Dasgupta and Chakra- barti, 1973, Dasgupta, 1975
<i>Rhytinota</i> sp.	♂ 20	Xyp	Sharma <i>et al.</i> , 1973
<i>Sphenariopsis impolita</i> Fairmaire	♂ 20	Xyp	Yadav and Pillai, 1974c
<i>S. tristis</i> Kraatz	♂ 20	Xyp	Kacker, 1976
<i>Oxycara mellyi</i> Fairmaire	♂ 20	Xyp	Yadav and Pillai, 1974c
Subfamily PIMELIINAE			
<i>Pimelia inexpectata</i> Sen	♂ 18	Xyp	Yadav and Pillai, 1974c,d
Subfamily PEDININAE			
<i>Platynotus excavatus</i> Fabricius	♂ 20	Xyr	Dasgupta and Chakra- barti, 1973
<i>P. punctatipennis</i> Mulsant	♂ 20	Xyp	Dasgupta, 1975
<i>Pseudoblaps mellyi</i> Mulsant	♂ 20	Xyp	Kacker, 1976
<i>Pseudoblaps mellyi</i> Mulsant	♂ 20	Xyp	Yadav and Pillai, 1973a
<i>Mesomorphus villiger</i> Blanchard	♂ 19	XO	Yadav and Pillai, 1974c,d
Subfamily OPATRINAE			
<i>Scleron granulipenne</i> Fairmaire	♂ 22	Xyp	Yadav and Pillai, 1974d
<i>S. reitteri</i> Geb.	♂ 22	Xyp	Yadav and Pillai, 1973a
<i>Scleron</i> sp.	♂ 20	Xyp	Shankarappa, 1971

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>Gonocephalum</i> <i>bilineatum</i> Walker	♂ 20	Xyp	Yadav and Pillai, 1973a
<i>G. depressum</i> Fabricius	♂ 20	Xyp	Joneja, 1960, 1961 ; Saha and Manna, 1971 ; Shank- arappa, 1971, Dasgupta and Chakrabarti, 1973. Yadav and Pillai, 1974c, Dasgupta, 1975
<i>G. dorsogranosum</i> Fairmaire	♂ 20	Xyp	Yadav and Pillai, 1974c, d
<i>G. elongatum</i> Guerin	♂ 20	Xyr	Agarwal, 1960a, d
<i>G. hoffmannseggi</i> Stev.	♂ 20	Xyp	Yadav and Pillai, 1974c,
<i>G. oblongum</i> Fabricius	♂ 20	Xyp	Yadav and Pillai, 1974c, d
<i>G. parallelum</i> Kaszab	♂ 20	Xyp Xyr	Yadav and Pillai, 1974c, Yadav and Pillai, 1974d
<i>G. tuberculatum</i> Hope	♂ 20	Xyp	Yadav and Pillai, 1974c
<i>G. vagum</i> Stev.	♂ 20	Xyp	Yadav and Pillai, 1973a
<i>Gonocephalum</i> sp.	♂ 20	Xyp	Lahiri and Manna, 1969
<i>Gonocephalum</i> sp.	♂ 20	Xyr	Saha and Manna, 1971
<i>Opatrum bilineatum</i> Walker	♂ 20	Xyp	Kacker, 1968
<i>Opatroides vicinum</i> Fairmaire	♂ 20 ♂ 21 ♂ 20	Xy Xyy Xyp	Dutt, 1953 Sharma <i>et al.</i> , 1973 Yadav and Pillai, 1974b, c
Subfamily ULOMINAE			
<i>Tribolium</i> <i>castaneum</i> Herbst	♂ 20	Xyp	Sharma <i>et al.</i> , 1973
<i>Alphitobius</i> <i>diaperinus</i> (Panzer)	♂ 19	XO	Sharma, <i>et al.</i> , 1973 Yadav and Pillai, 1974c, d
<i>Alphitobius</i> sp.	♂ 20	Xyp	Joneja, 1960
Subfamily COSSYPHINAE			
<i>Cossyphus</i> <i>depressus</i> (Fabricius)	♂ 18	Xyp	Kacker, 1968, Yadav and Pillai, 1974d

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
Subfamily TENEBRIONIAE			
<i>Derosphaerus cribrum</i> Fairmaire	♂ 20	Xyp	Manna and Lahiri, 1972
Subfamily AMARYGMINAE			
<i>Hoplobrachium asperipenne</i> Fairmaire	♂ 22	Xyp	Manna and Lahiri, 1972 Kacker, 1973
14. MELOIDAE			
Subfamily MELOINAE			
EPICAUTINI			
<i>Psalydolytta</i> sp. nr. <i>rouxi</i> Laporte	♂ 20	Xyp	Kacker, 1976
MYLABRINI			
<i>Mylabris balteata</i> Pallas	♂ 20	Xyr	Dasgupta, 1974
<i>M. himalayica</i> Saha	♂ 22	Xyp	Dua and Kacker, 1976
<i>M. macilenta</i> Marseul	♂ 22	Xyp	Joneja, 1960
<i>M. phalerata</i> Pallas ⁴	♂ 22	Xyp	Yadav, 1973b
	♂ 22	Xyr	Dasgupta, 1974
	♂ 22	Xyp	Saha and Manna, 1971, Manna and Lahiri, 1972. Yadav <i>et al.</i> , 1974
<i>M. pustulata</i> Thunberg	♂ 22	Xy	Asana <i>et al.</i> , 1942
	♂ 22	Xyp	Yadav, 1973 b, Yadav, <i>et al.</i> , 1974 ; Dua and Kacker, 1975
<i>M. thunbergi</i> Pallas	♂ 22	Xyp Xy	Agarwal, 1960 a, Agarwal, 1962
LYTTINI			
<i>Lytta picta</i> Cast.	♂ 20	Xyp	Dasgupta, 1974
<i>Cyaneolytta</i> sp.	♂ 20	Xyp	Kacker, 1976
<i>Sybaris paraeustus</i> Bedt.	♂ 20	Xyp	Joneja, 1960
<i>S. testaceus</i> (Fabricius)	♂ 20	Xyp	Dasgupta, 1974
MELOINI			
<i>Meloe</i> sp.	♂ 20	Xy	Asana <i>et al.</i> , 1942

4. *Mylabris phalerata* = *Mylabris phalerata* (Dasgupta, 1974a) = *Mylabris phalcrata* (Yadav, 1973b)

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
CHRYSOMELOIDEA			
15. CERAMBYCIDAE			
Subfamily CERAMBYCINAE			
<i>Stromatium barbatum</i> Fabricius	♂ 19	XO	Manna and Lahiri, 1972
<i>Chlorophorus annularis</i> (Fabricius)	♂ 20	Xyp	Kacker, 1967
<i>Plocaederus obesus</i> Gahan	♂ 10		Nath. <i>et al.</i> , 1951
<i>Plocaederus</i> sp.	♂ 18	Xy	Dua and Kacker, 1976a
Subfamily LAMIINAE			
<i>Batocera rubus</i> Linnaeus	♂ 20	Xyp Xy	Agarwal, 1960a Agarwal, 1962
<i>Apomecyna neglecta</i> Pascoe	♂ 22	Xyp	Manna and Lahiri, 1972
16. BRUCHIDAE			
Subfamily BRUCHINAE			
<i>Callosobruchus analis</i> (Fabricius)	♂ 20 ♂ ♀ 20	Xyp Xyp : XX	Sharma <i>et al.</i> , 1967c Yadav, 1969, 1971a
<i>C. chinensis</i> (Linnaeus)	♂ 20 ♂ ♀ 20	Xyp Xyp : XX	Sharma <i>et al.</i> , 1967c Yadav, 1969, 1971a
<i>C. maculatus</i> (Fabricius)	♂ 20 ♂ ♀ 20	Xyp Xyp : XX	Sharma <i>et al.</i> , 1967c Yadav, 1969, 1971a
<i>Bruchus analis</i> Fabricius	♂ ♀ 20	Xyp : XX	Agarwal, 1960a, e
<i>B. pisorum</i> Linnaeus	♂ 22 ♂ ♀ 22		Sharma <i>et al.</i> 1967b Yadav, 1969, 1973c
<i>Bruchidius albizziae</i> <i>B. augustifrons</i> <i>B. aureus</i> Arora <i>B. dimorphous</i> <i>B. mimosae</i>	♂ 22 ♂ 34 ♂ 20 ♂ 20 ♂ 22	Xyp Xyp Xyp Xyp Xyp	Yadav, 1969 Sharma <i>et al.</i> , 1967b Yadav, 1969, 1973c Yadav, 1969 Yadav, 1969

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>B. multilineolatus</i> (Pic)	♂ 20	Xyp	Yadav, 1969, 1973c
<i>B. saundersi</i> (Jek)	♂ ♀ 20	Xyp : XX	Yadav, 1969, 1973c
<i>B. urbanus</i> (Sharp)	♂ 20	Xyp	Yadav, 1969
<i>Bruchidius</i> sp.	♂ 22	Xyp	Sharma <i>et al.</i> , 1967b
<i>Conicobruchus</i> <i>indicus</i> (Pic)	♂ 20	Xyp	Yadav, 1969, 1973c
<i>Specularius</i> <i>maindroni</i> (Pic)	♂ ♀ 22	Xyp : XX	Yadav, 1969, 1973c
Subfamily AMBLYCERINAE			
<i>Spermophagus</i>	♂ 32	Xy	Yadav, 1969
<i>latescenta</i> Arora	♂ 32	Xyp	Yadav, 1973c
Subfamily PACHYMERINAE			
<i>Caryedon acaciae</i>	♂ 18	Xyp	Sharma <i>et al</i> 1967a, Yadav, 1973a
<i>C. gonagra</i>	♂ 18	Xyp	Sharma <i>et al.</i> , 1967a
Fabricius	♂ ♀ 18	Xyp : XX	Yadav, 1969, Kacker, 1973
<i>C. lineatonota</i>	♂ 18 ♂ 20	Xyp Xyp	Yadav, 1969 Yadav, 1973a
<i>C. longus</i>	♂ 18	Xyp	Yadav, 1969, 1973a
<i>C. opacus</i>	♂ 18	Xyp	Yadav, 1969, 1973a
<i>C. prosopisus</i>	♂ 18	Xyp	Yadav, 1973a
<i>C. serratus</i>	♂ 18	Xyp	Yadav, 1973a
<i>Caryedon</i> sp.	♂ 20-26	Xyp	Sharma <i>et al.</i> 1967a
<i>Pachymerus chinensis</i> Linnaeus	♂ 20	Xyp	Agarwal, 1960a, e
17. CHRYSOMELIDAE			
Subfamily SAGRINAE			
<i>Sagra femorata</i> Drury	♂ 16	Xy	Yadav, 1971b
Subfamily CRIOCERINAE			
<i>Lema lacordairei</i> Baly	♂ 20	Xy	Dua and Kacker, 1975
<i>L. nigro-frontalis</i> Clark	♂ 16	Xyp	Yadav and Pillai, 1974a
<i>L. praeusta</i> Fabricius	♂ 16	Xyp	Yadav and Pillai, 1974a

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>L. rufo-testacea</i> Clark	♂ 14	Xyp	Yadav and Pillai, 1974a
<i>Lema</i> sp.	♂ 16	Xyp	Kacker, 1976
<i>Crioceris impressa</i> Fabricius	♂ 20	Xyr	Saha and Manna, 1971; Saha, 1973
Subfamily CLYTRINAE			
<i>Merilia lunulata</i> Fabricius	♂ 22	X+y+y	Dasgupta and Chakrabarti, 1972b; Dasgupta, 1973
<i>Clytra succincta</i> Laccordaire	♂ 40	Xy	Yadav, 1971b
<i>Diapromorpha pallens</i> (Olivier)	♂ 22	Xy	Dua and Kacker, 1975
<i>D. turcica</i> Fabricius	♂ 22 ♂ 23	X+y X+y ₁ y ₂	Yadav, 1971b, 1976 Yadav, 1971b, 1976
Subfamily CRYPTOCEPHALINAE			
<i>Cryptocephalus analis</i> Olivier	♂ 30	Xyp	Yadav, 1971b
<i>C. sexsignatus</i> Fabricius	♂ 30	Xy	Kacker, 1976
<i>Cryptocephalus</i> sp. (15)	♂ 30	Xyp	Yadav, 1971b
<i>Cryptocephalus</i> sp. (19)	♂ 30	Xyp	Yadav, 1971b
Subfamily EUMOLPINAE			
<i>Colasposoma auripenne</i> Motschulsky	♂ 16	Xyp	Yadav and Pillai, 1976a
<i>C. ornatum</i> Jacoby	♂ 16	Xyp	Yadav, 1971b
<i>C. rufipes</i> Jacoby	♂ 16	Xyp	Dasgupta and Chakrabarti, 1972b, Dasgupta, 1973
<i>C. semicostatum</i> Jacoby	♂ 16	Xyp	Yadav and Pillai, 1976, Dua and Kacker, Unpub
<i>Colasposoma</i> sp.	♂ 16	Xyp	Dasgupta and Chakrabarti, 1972, Dasgupta, 1973
<i>Corynodes modestus</i> Jacoby	♂ 30	Xyp	Yadav, 1971b

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>C. peregrinus</i> Fuessly	♂ 30	Xyp	Yadav, 1971b
	♂ 28	Xy	Manna and Lahiri, 1972
Subfamily GALERUCINAE			
<i>Oides bipunctata</i> Fabricius	♂ 17	XO	Kacker, 1976
<i>Aulacophora cincta</i> (Fabricius)	♂ 30	Xy	Dasgupta and Chakra- barti, 1972b, Dasgupta, 1973
<i>A. foveicollis</i> (Lucas)	♂ 30		Nath <i>et al.</i> , 1951
	♂ 30	Xy	Saha and Manna, 1971
	♂ 30	Xyp	Yadav, 1971b
	♂ 59	XXy	Manna and Lahiri, 1972, Dua and Kacker, Unpub
<i>A. intermedia</i> Jacoby	♂ 30	Xy	Dasgupta, 1963
	♂ 57	XXy	Manna and Lahiri, 1972, Kacker, 1976
<i>Galerucella birmanica</i> (Jacoby)	♂ 34	Xyp	Yadav, 1971b
<i>Peridea</i> sp.	♂ 40	Xy	Kacker, 1976
Subfamily ALTICINAE HALTICINAE			
<i>Hyphasoma</i> sp.	♂ 22	Neo- Xy	Kacker, 1976
<i>Podontia quatuordecim-</i> <i>punctata</i> Linnaeus	♂ 36		Manna and Lahiri, 1972
<i>Ophrida marmorea</i> Wiedemann	♂ 32	Xy	Yadav, 1971b
<i>Altica = Haltica</i> <i>caerulescens</i> Baly	♂ 24	X+y	Yadav, 1971b
<i>A. coerulea</i> Olivier	♂ 23	Xy ₁ y ₂	Kasturibai and Sugandhi, 1968
	♂ 24	X+y	Manna and Lahiri, 1972
<i>Altica</i> sp.	♂ 22	Xyp	Lahiri and Manna, 1969
Subfamily HISPINAE			
<i>Estigmena chinensis</i> Hope	♂ 18	Xyp	Yadav, 1971b

TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMOSOMES (2n)	SEX CHROMOSOME	REFERENCE
<i>Dactylispa atkinsoni</i> Gestro	♂ 16	Xyp	Kacker, 1976
<i>Hispa armigera</i> Olivier	♂ 12, 18	Xy	Saha and Manna, 1971, Saha, 1973
Subfamily CASSIDINAE			
<i>Calopepla leayana</i> Latreille	♂ 18	Xyp	Yadav, 1971b
<i>Aspidomorpha furcata</i> Thunberg	♂ 18	Xyp	Dasgupta and Chakrabarti, 1972b, Dasgupta, 1973
<i>A. indica</i> Boheman	♂ ♀ 18	Xyp : XX	Dua and Kacker, 1975, 1976a
<i>A. miliaris</i> Fabricius	♂ 18	Xyp	Manna and Lahiri, 1972
	♂ ♀ 18	Xyp : XX	Dua and Kacker 1975, 1976a
<i>Laccoptera quadrimaculata</i> Thunberg	♂ 18 ♀ 18	Xyp XX	Kacker 1976 Dua and Kacker, 1975
<i>Glyphocassis trilineata</i> Hope	♂ 18	Xyp	Yadav, 1973b, Yadav and Pillai, 1975d
<i>Cassida circumdata</i> Herbst	♂ 18	Xyp	Manna and Lahiri 1972, Yadav 1973b, Yadav and Pillai, 1975d
<i>C. indicola</i> Duvivier	♂ 18	Xyp	Yadav, 1973b, Yadav and Pillai, 1975d
<i>Chirida bipunctata</i> Linnaeus	♂ 18	Xyp	Dasgupta and Chakrabarti, 1972b Dasgupta, 1973
<i>Chirida</i> sp.	♂ 36	Xyp	Yadav and Pillai, 1975d

CURCULIONIDEA

18. APIONIDAE

Subfamily APIONINAE

<i>Apion</i> sp.	♂ 22	Xyp	Manna and Lahiri, 1972
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TAXONOMIC CATEGORY	DIPLOID NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
19. CURCULIONIDAE			
Subfamily BRACHYDERINAE			
<i>Blosyrus asellus</i> Olivier	♀ 22	XX	Dua and Kacker, 1976a
<i>Tanymecus indicus</i> Faust	♂ 22	Xyp	Yadav, 1972, Yadav and Pillai, 1973b
<i>T. sciurus</i> Olivier	♂ 22	Xyp	Yadav, 1972
<i>Tanymecus</i> sp.	♂ 22	Xyp	Yadav, 1972
<i>Astycus lateralis</i> Fabricius	♂ ♀ 22	Xyp : XX	Agarwal, 1960a
	♂ 22	Xyp	Saha and Manna, 1971 ; Manna and Lahiri 1972 ; Saha, 1973
	♂ 23	Xy ₁ y ₂	Dua and Kacker, 1975, 1976b
<i>Cylas formicarius</i> Fabricius	♂ 22	Xyp	Manna and Lahiri, 1972
Subfamily OTTIORHYNCHINAE			
<i>Mylocerus</i> <i>subfasciatus</i> Guerin	♂ 22	Xyp	Yadav, 1972
<i>M. undecimpustulatus</i> Faust			
<i>maculosus</i> Westood	♂ 22	Xyp	Yadav, 1972
<i>M. viridanus</i> Fabricius ⁵	♂ 22	Xyp	Dasgupta and Basile, 1966
Subfamily EREMININAE			
<i>Corigetis</i> sp.	♂ 22	Xyp	Yadav, 1972
Subfamily CLEONINAE			
<i>Hypolixus</i> <i>truncatulus</i> Bobr.	♂ 44	Xyp	Yadav, 1973b, Yadav and Pillai, 1973b
Subfamily HYLOBIINAE			
<i>Hylobius angustus</i> Faust	♂ 20	Xyp	Dua and Kacker, Unpub

5. *Mylocerus viridanus* = *Mylocerus viridens* (Dasgupta and Basile, 1966)

TAXONOMIC CATEGORY	DIPLIOD NUMBER OF CHROMO- SOMES (2n)	SEX CHROMO- SOME	REFERENCE
<i>Paramecops farinosus</i> Wiedemann	♂ 32	Xyp	Yadav, 1973b, Yadav and Pillai, 1973b
Subfamily ERIRRHINAE			
<i>Echinocnemus marmoreus</i> Marshall	♂ 18	Xyp	Yadav and Pillai, 1973b
<i>Echinocnemus</i> sp.	♂ 18	Xyp	Yadav, 1973b
Subfamily GYMNETRINAE			
<i>Alcides roelofsi</i> Lewis ⁶	♂ 28	Xyp	Dua and Kacker, Unpub
<i>A. westermanni</i> Boheman ⁷	♂ 28	Xyr	Dua and Kacker, Unpub
<i>Alcides</i> sp.	♂ 40	Xy	Dasgupta, 1963
Subfamily CRYPTORRHINCHINAE			
<i>Desmidophorus helies</i>	♂ 20	Xyp	Lahiri and Manna, 1969
Subfamily ZYGOPINAE			
<i>Coryssomerus</i> sp.	♂ 24	Xyp	Yadav, 1973b
<i>Anobleptus</i> sp.	♂ 24	Xyp	Yadav and Pillai, 1973b
Subfamily RHYNCHOPHORINAE			
<i>Rhynchophorus ferrogineus</i>	♂ 22	Xyp	Lahiri and Manna, 1969
<i>Calandra linieris</i> (Herbst)	♂ 24	Xyp	Yadav, 1973b ; Yadav and Pillai, 1973b

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6. *Alcides roelofsi* = *Alcides* sp. (Dua and Kacker, 1975)

7. *Alcides westermanni* = *Alcides stevensi* (Dua and Kacker, 1976a)

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