

DESCRIPTIONS OF THE GENITALIA OF SOME INDIAN SPECIES OF GENUS  
*MYLLOCERUS* SCHONHERR, 1826 (COLEOPTERA : CURCULIONIDAE :  
OTIORRHYNCHINAE

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INTRODUCTION

In the present communication, an endeavour has been made to study the male and female genitalia of twenty eight species of genus *Myllocerus* Sch. (Curculionidae : Otiorrhynchinae) from Indian region. An attempt is made to study the taxonomic importance of male and female genitalia at species level.

*Myllocerus* Schn. is a large and somewhat heterogenous genus represented by about 71 species and subspecies from Indian sub-region alone. Its distribution extends to Africa, Eastern Europe, Central and Southern Asia, and Australia. Many species of the genus are polyphagous pests of forest, agriculture and horticultural plants and are as such of economic importance.

MATERIAL AND TECHNIQUES

Both male and female genitalia were dissected out from the authentically identified specimens present in the collections of Forest Entomology Branch, Forest Research Institute, Dehradun. For preparation of genitalia mounts, method described by Kumar & Sen-Sarma (1974) has been followed. Terminology used for the genitalia is after Lindroth & Palmén (1970) and Spett & Lewitt (1928).

GENERAL DESCRIPTION OF TYPICAL "MALE" AND "FEMALE"  
GENITALIA OF GENUS *MYLLOCERUS* SCHN.

*Male Genitalia* (Fig. 1) : Similar to that of tribe Cyphicerini (Kumar & Sen-Sarma, 1974) ; the general plan is "annulate type". Aedeagus comprises an elongate subcylindrical penis (P), with well developed paired apophyses of penis (AP. P.) and an internal sac (INT. S.) with chitinous endophallic armature (END. ARM.). Basal piece (B. PC.) of tagmen (T.)

forms a complete ring around penis with which it is loosely connected permitting the movement of the latter; *parameres* completely reduced and can not be distinguished from the weakly chitinized basal piece. Proximally, the basal piece is produced to form a long *manubrium* (MN). Internal sac is tubular and armed with a series of spines, denticles, papillae, etc., forming a well developed and distinct endophallic armature. Pattern of armature is characteristic of each species thus making it a useful taxonomic character at species level. It functions on the "lock and key" principle.

*Female genitalia* : is "tubular type" with well developed *bursa copulatrix*; spermathecal duct is long and narrow and it opens into the bursa copulatrix. *Spermatheca* is sclerotized and invariably has distinct dorsal arms (the *collum* and *ramus*); the *cornu* or bent part of the capsule may be pointed or blunt apically, shape and size of the capsule varies distinctly in different species and provides an important taxonomic character at species level (cf. plate 1). *Bursa copulatrix* is well developed in this genus, it is variable and found to be conspecific in the species studied.

### Genus *Myllocer* Schonherr

*Myllocer* Schonherr, 1826, *Disp. Meth.* : 178.

#### 1. *Myllocer* *viridanus* (Fabricius, 1775)

(Figs. 1-8)

*Curculio viridanus* Fabricius, 1775, *Syst. Ent.*, : 155.

*Penis* (Fig. 1) subcylindrical, sclerotized and broad framed; paired apophyses well developed, converging proximally; distal margin of penis gently curved, chitinized (Fig. 2); ostium narrow, long; tagmen with a ring like basal piece and well developed manubrium; *endophallus* (Fig. 3) internal sac narrow, cylindrical, *endophallic armature* (Figs. 3-6) in the form of 3 bean-shaped patches of parallel arranged spines, a bunch of papillae present apically. *Spermatheca* (Fig. 7) capsule weakly sclerotized, collum obliquely forward, ramus knob like, blunt at apex, *bursa copulatrix* (Fig. 8) with a series of parallel arranged sclerotized bands.

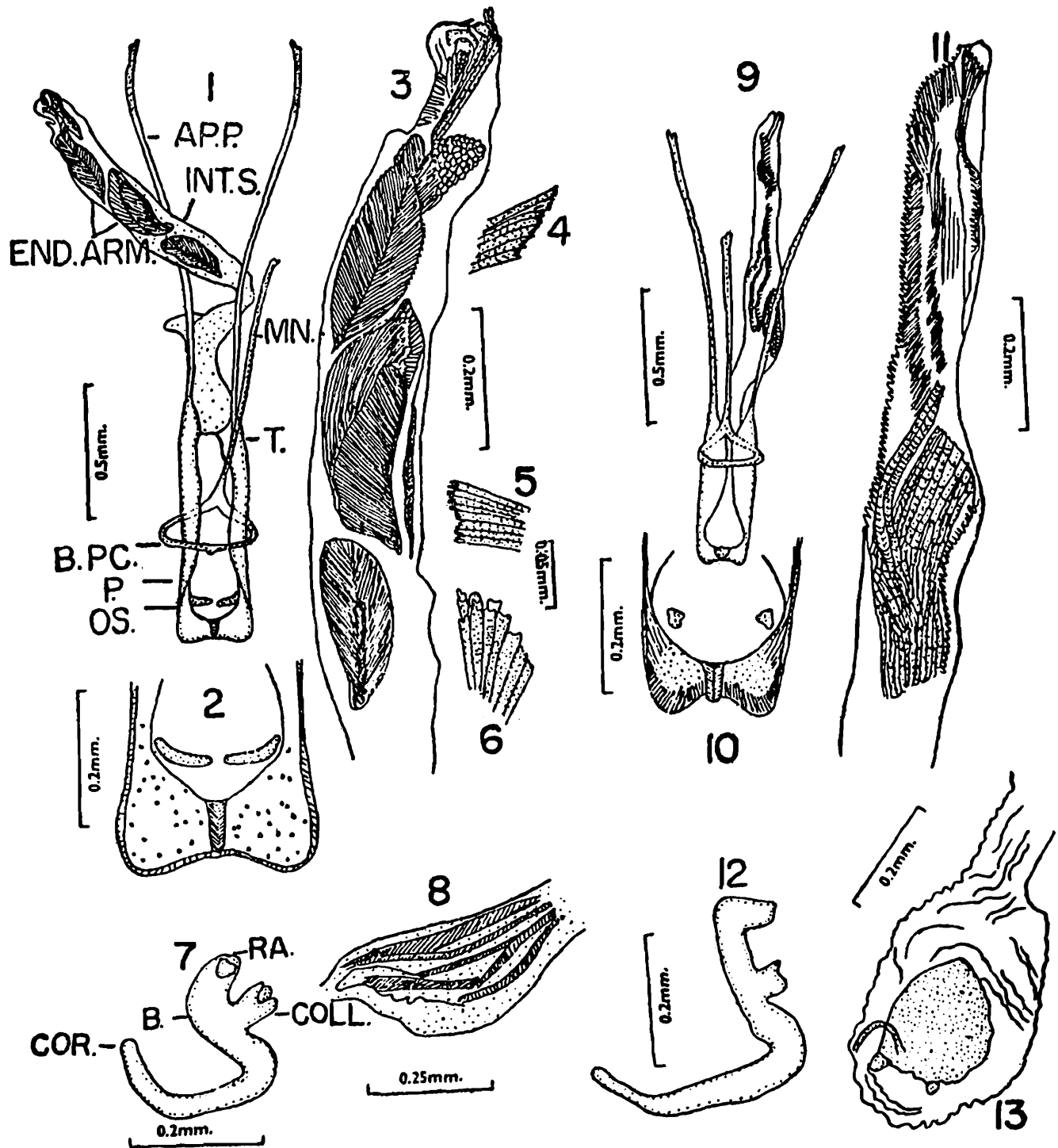
#### 2. *Myllocer* *paetus* Marshall, 1916

(Figs. 9-13)

*Myllocer* *paetus* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhynchophora : Curculionidae)* : 303.

*Penis* (Fig. 9) weakly sclerotized, lateral sides almost parallel; apex gently curved (Fig. 10), ostium well developed; apophyses weak diverging apically; internal sac narrow,

long ; *endophallic armature* (Fig. 11) in the form of long curved chitinized bands in the basal portion, while a narrow strips of spines present apically. *Spermatheca* (Fig. 12) capsule uniformly sclerotized, cornu long and narrow almost vertically bent ; both collum and ramus transversally bent forming 'F' shape. *Bursa copulatrix* (Fig. 13) flask like, oval with a median chitinous patch.



Figs. 1-13 : *Myllocerus viridanus* (Fabricius) : Aedeagus (dorsal view), 2- apical end of penis, 3- internal sac ; 4- 5- 6- endophallic armature, 7- spermatheca ; 8- bursa copulatrix. *Myllocerus paetus* Marshall : 9- aedeagus, 10- apical end of penis, 11- internal sac, 12- spermatheca, 13- bursa copulatrix.

*Aedeagus* (Fig. 14) with penis flat and broad diverging laterally at the middle ; apophyses long, gently curved in ; basal piece weak ; manubrium long, thin, well developed, ostium extending beyond apical margin of penis (Fig. 15) ; *Endophallus* (Figs. 14 & 16) narrow cylindrical with 3 pinnate bands of armature situated at a basal, middle and apical portions ; spines arranged like book leaves ; terminating apically into a tendril like projection. *Spermatheca* (Fig. 17) body bulbous, cornu deeply curved over the body, ramus "C" shaped, collum well developed, thumb like. *Bursa copulatrix* (Fig. 18) well developed, club shaped.

#### 4. *Mylocerus delicatulus* Boheman, 1843 (Figs. 19-22)

*Mylocerus delicatulus* Boheman, Schönh, 1843, *Gen. Curc.*, 7(1): 6.

*Aedeagus* (Fig. 19) with robust, subcylindrical penis, substraight laterally, apical margin weakly convex ; ostium medium sized ; apophyses long, narrow, gently diverging apically, basal piece well developed ; *endophallus* (Figs. 19-21) internal sac somewhat narrow apically ; endophallic armature well developed in the apical half, present in the form of two lateral bands of obliquely arranged spines. *Spermatheca* (Fig. 22) tubercular, cornu long, curved and narrow at apex ; ramus with short neck bending obliquely over the body, wedged apically ; collum short and straight.

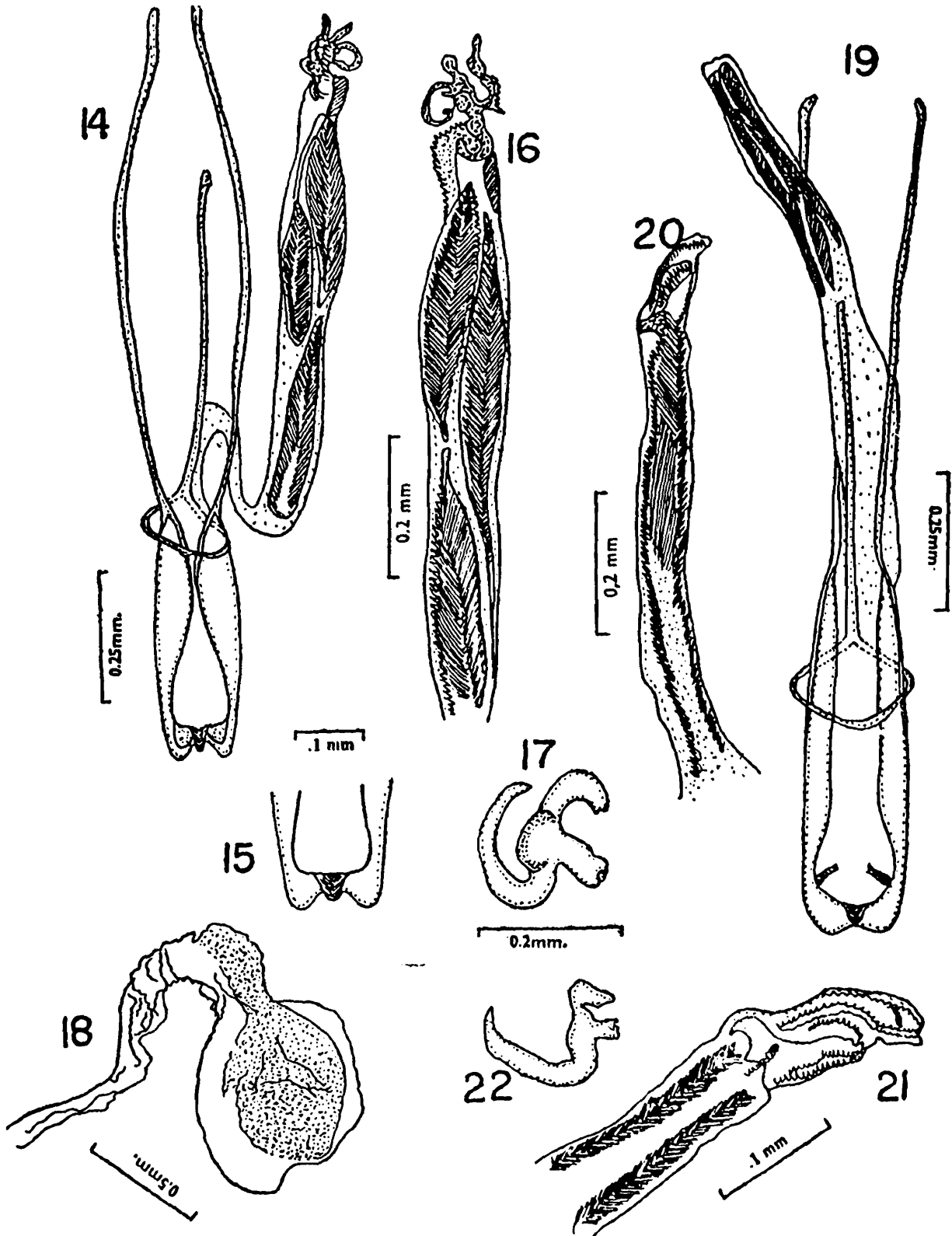
#### 5. *Mylocerus tenuiclavis* Marshall, 1916 (Figs. 23-26)

*Mylocerus tenuiclavis* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhynchophora : Curculionidae)* : 327-328.

*Aedeagus* (Fig. 23) medium sized with narrow elongated internal sac ; penis flattened, apical margin deeply concave ; ostium reduced ; apophyses almost straight ; basal piece weak, manubrium long ; *endophallus* (Figs. 23-25) armature well developed, arranged in the form of two bands of obliquely arranged spines in narrow basal portion, with chitinous dentations in the broad apical half and again in the form of long chitinous spines in the narrow apex. *Spermatheca* (Fig. 26) bulbous, forming a thumb at the base of ramus ; cornu narrow, curved and pointed at apex ; ramus compressed "C" shaped, thrown back a bit, collum medium sized ; knob like, directed upwards.

3. *Myllocerus evasus* Marshall, 1916  
(Figs. 14-18)

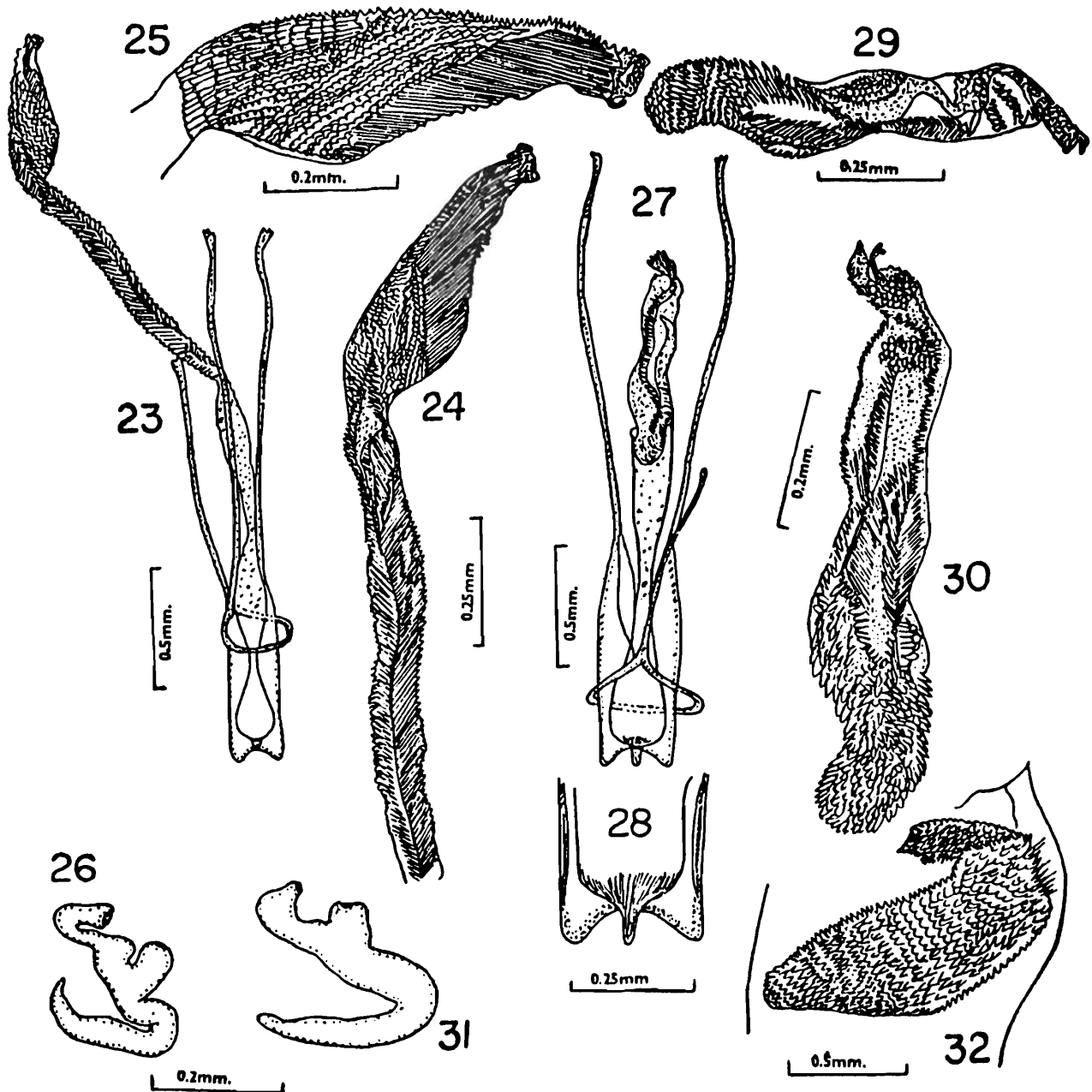
*Myllocerus evasus* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)*: 304.



Figs. 14-22 : *Myllocerus evasus* Marshall : 14- aedeagus, 15- distal end penis, 16- internal sac, 17- spermatheca, 18- bursa copulatrix, *Myllocerus delicatulus* Boheman, 19- aedeagus, 20- internal sac, 21- apical half internal sac, 22- spermatheca.

6. *Mylocerus fabricii* Guerin, 1843

(Figs. 27-32)

*Mylocerus fabricii* Guerin, 1843, *Voy. Deless.*, 2 : 53.

Figs. 23-32 : *Mylocerus tenuiclavis* Marshall : 23- aedeagus, 24- internal sac, 25- endophallic armature, 26- spermatheca, *Mylocerus fabricii* Guerin, 27- Aedeagus, 28- apical end penis, 29- internal sac, 30- endophallic armature, 31- spermatheca, 32- bursa copulatrix.

*Aedeagus* (Fig. 27) medium sized, apical margin penis deeply curved (Fig. 28), ostium well developed extending beyond its apical margin, opophyses medium sized, arched apically,

basal piece large ; manubrium reduced ; *endophallus* (Figs. 29 & 30) internal sac cylindrical sac like and deeply serrated, armature comprising overlapping oblique rows of denticles in basal half, a number of cuticular scales present apically, extremely chitinized. *Spermatheca* (Fig. 31) body large ; ramus beak like ; collum bulbous, cornu long, cylindrical, deeply curved. *Bursa copulatrix* (Fig. 32) large, sac like, with densely arranged rows of overlapping chitinous plates.

#### 7. *Myllocerus laetivirens* Marshall, 1916 (Figs. 33-35)

*Myllocerus laetivirens* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 327-328.

*Aedeagus* (Fig. 33) large but weakly chitinized, penis somewhat flattened, broader, at the base ; ostium reduced ; apophyses long, widely diverging apically, basal piece weak ; *endophallus* (Figs. 33 & 34) internal sac medium sized, armature 'bean' shaped, restricted to proximal half only ; parallelly arranged oblique chitinous serrations present. *Spermatheca* (Fig. 35) sclerotized, bulbous and strongly arched apically, ramus short, blunt, collum enlarged and protruding out ; cornu tapering towards apex, angulated.

#### 8. *Myllocerus sabulosus* Marshall, 1916 (Figs. 36-38)

*Myllocerus sabulosus* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 336-337.

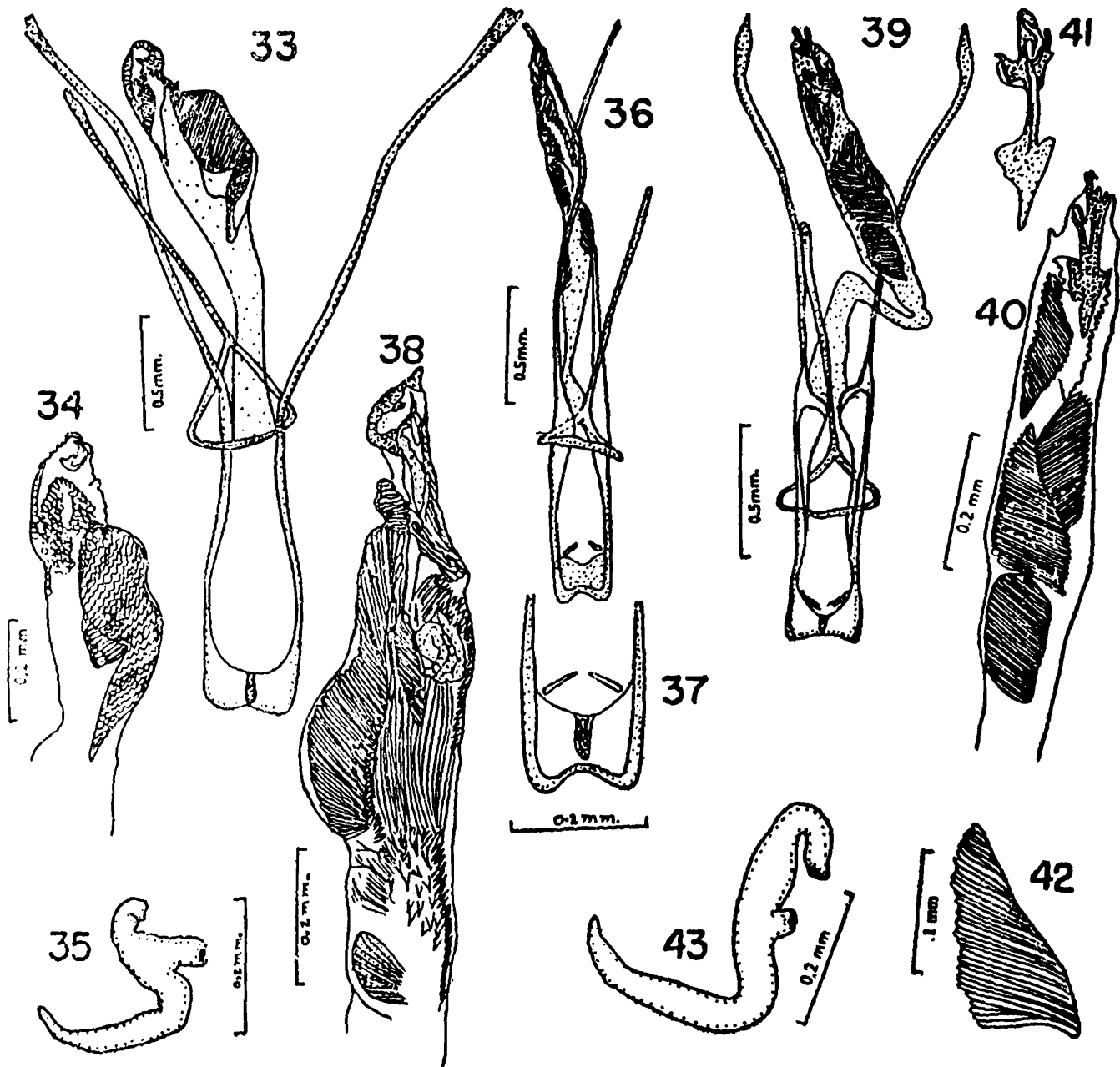
*Aedeagus* (Fig. 36) weakly sclerotized, penis small, lateral sides sub-parallel, apical margin moderately curved, ostium weak not extending up to the apical margin, apophyses medium sized, basal piece weak ; *endophallus* (Figs. 36 & 38) internal sac elongate, bulbous in the middle, densely chitinized with a varied armature of spines, plates and papillae (Fig. 38).

#### 9. *Myllocerus transmarinus* (Herbst, 1795) (Figs. 39-43)

*Curculio transmarinus* Herbst, 1795, *Kaf.* 6 : 213.

*Aedeagus* (Fig. 39) well formed, lateral sides of penis converging gently in basal half ; apical margin of penis very slightly curved, subcylindrical ; ostium medium sized ; apophyses

medium, distinctly diverging at the apex ; *endophallus* (Figs. 39-42) internal sac large, spindle shaped with a number of apical hooks ; armature comprises 4 bean shaped, chitinous, peripherally arranged bands (Figs. 40), plates arranged obliquely like book leaves (Fig. 42).



**Figs. 33-43 :** *Myllocerus laetivirens* Marshall : 33- aedeagus, 34- internal sac, 35- spermatheca. *Myllocerus sabulosus* Marshall, 36- aedeagus, 37- distal end penis, 38- endophallic armature. *Myllocerus transmarinus* (Herbst), 39- aedeagus, 40- endophallic armature, 41- apical end internal sac, 42- armature, 43- spermatheca.

*Spermatheca* (Fig. 43) large, ramus bulbous, inverted "U" shape ; collum reduced, wart like ; cornu well formed curved almost at right angles.

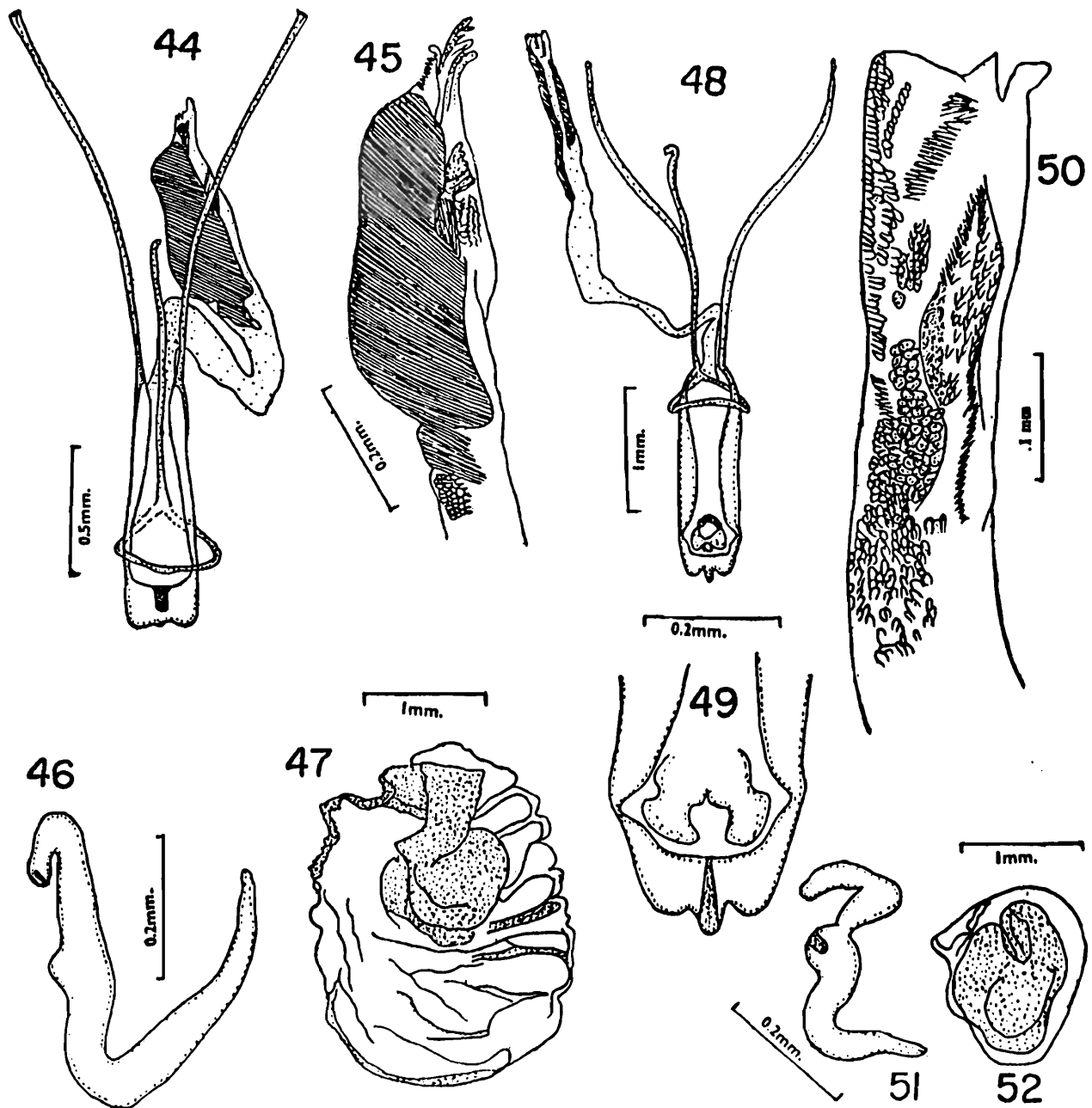


10. *Myllocerus cardoni* Marshall, 1916

(Figs. 44-47)

*Myllocerus cardoni* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhynchophora : Curculionidae)* : 339.

*Aedeagus* (Fig. 44) strongly sclerotized, elongated ; penis moderate, slightly narrow in basal half ; apical margin weakly curved, ostium small not extending up to the apical margin ; opophyses, narrow, long, basal piece medium ; *endophallus* (Figs. 44 & 45) internal



Figs. 44-52 : *Myllocerus cardoni* Marshall : 44- aedeagus, 45- endophallic armature, 46- spermatheca, 47- bursa copulatrix, *Myllocerus lefroyi* Marshall, 48- aedeagus, 49- apical end penis, 50- endophallic armature, 51- spermatheca, 52- bursa copulatrix.

sac large, thickly chitinous ; armature kidney shaped with the chitinous bands arranged in obliquely parallel rows in one patch (Fig. 45), apical margin ending in a number of spines. *Spermatheca* (Fig. 46) ramus apical, inverted "U" shaped ; collum much reduced papillae like ; cornu 'V' shaped, large ; *bursa copulatrix* (Fig. 47) large, oval, laterally convoluted, small median funnel shaped sclerotized portion distinct.

### 11. *Mylocerus lefroyi* Marshall, 1916

(Figs. 48-52)

*Mylocerus lefroyi* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 340-341.

*Aedeagus* (Fig. 48) rather medium, weakly sclerotized, penis dorso-ventrally flattened, apical margin strongly curved, ostium extending up to the end of the median protrusion ; apophyses long, narrow, basal piece medium with rather long manubrium ; *endophallus* (Fig. 50) moderately chitinized with a number of teeth and papillae present irregularly in lateral bands, apical margin truncated. *Spermatheca* (Fig. 51) ramus well developed finger like pointing forward, thrown back a bit, collum reduced, bulbous like a thumb, at the base of ramus ; cornu reduced curved at almost right angles, pointed apically, *bursa copulatrix* (Fig. 52) reduced, almost oval, a bulbous sclerotized patch covering the major area.

### 12. *Mylocerus severini* Marshall, 1916

(Figs. 53-57)

*Mylocerus severini* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 342

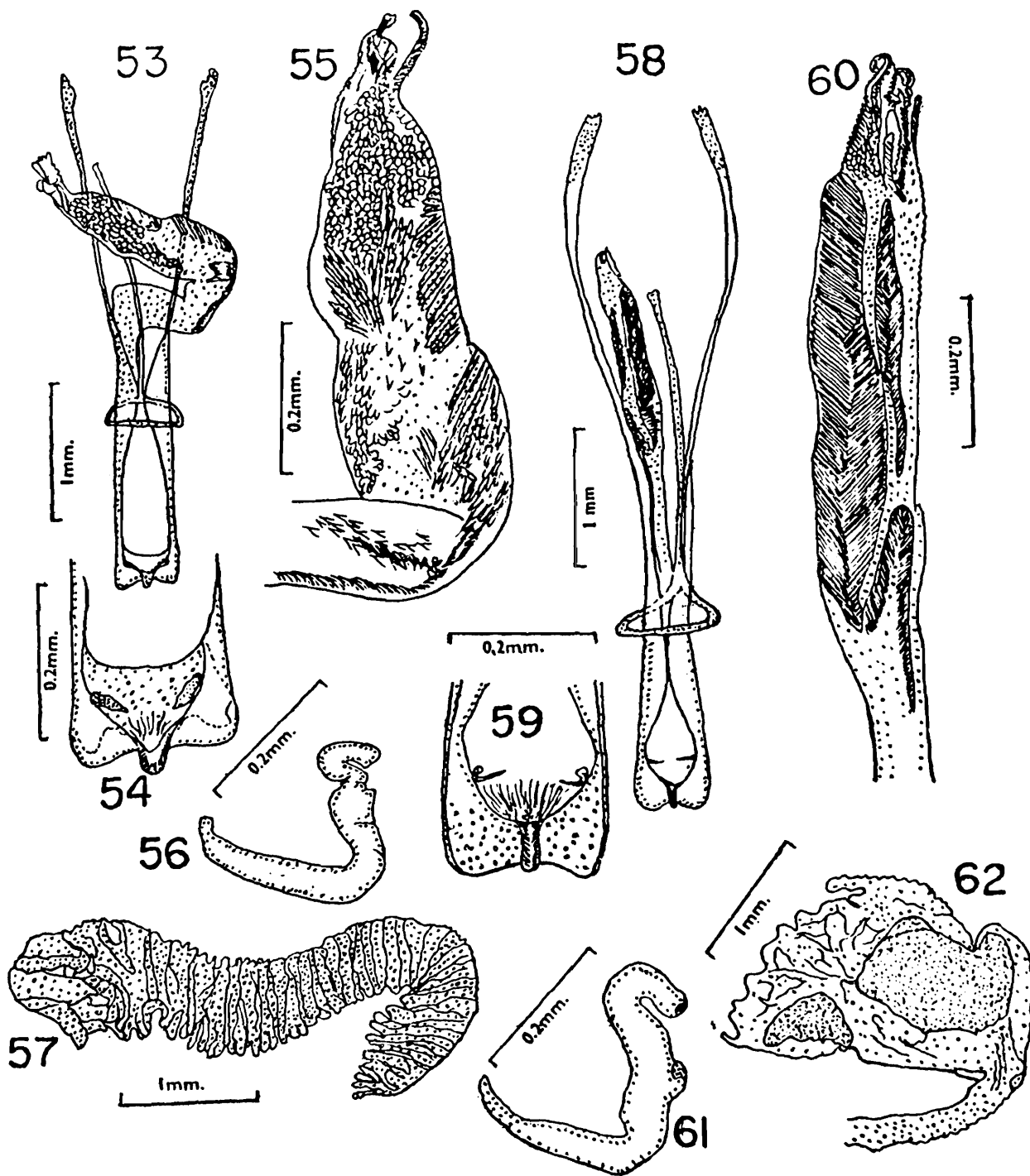
*Aedeagus* (Fig. 53) medium, moderately sclerotized, penis flattened, laterally sub-parallel, apical margin moderately curved, ostium well developed, extending beyond the apical margin (Fig. 54) ; *endophallus* (Fig. 55) internal sac enlarged, almost bell shaped, thickly chitinized with apical papillae and latero-obliquely arranged bands, a number of spines present too ; *spermatheca* (Fig. 56) ramus reduced, like the hook of a hanger, collum rudimentary, cornu moderate almost straight ; *bursa copulatrix* (Fig. 57) cylindrical, elongated, strongly curved at one end, wrinkled bands present throughout its length.

### 13. *Mylocerus curvicornis* (Fabricius, 1792)

(Figs. 58-62)

*Curculio curvicornis* Fabricius, 1792, *Ent. syst.*, 1 (2) : 488,

*Aedeagus* (Fig. 58) rather large with long apophyses, penis weakly sclerotized, convex apically, apical margin moderately curved, ostium well developed (Fig. 59), apical



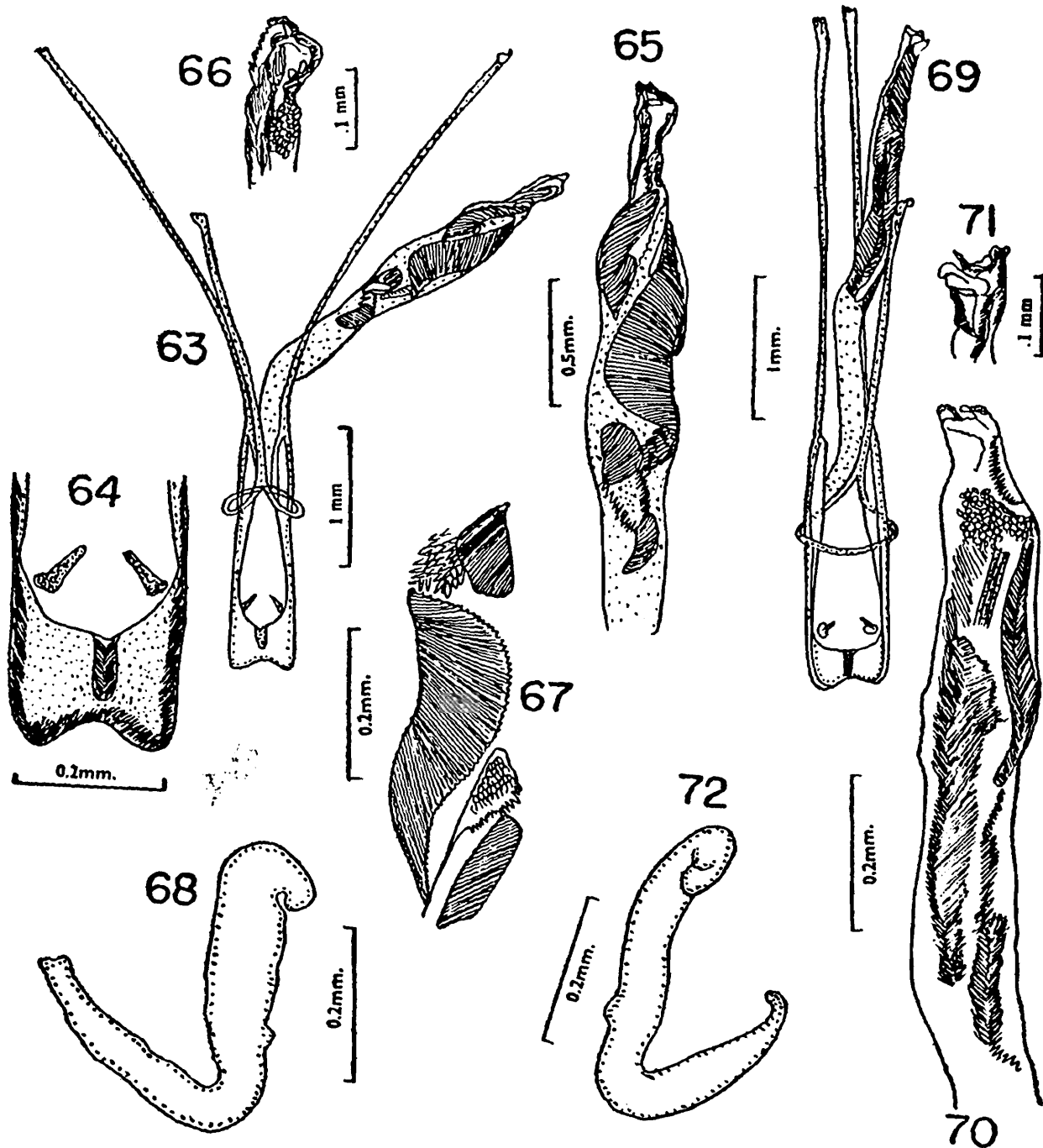
Figs. 53-62 : *Myllocerus severeni* Marshall : 53- aedeagus, 54- distal end penis, 55- endophallic armature, 56- spermatheca, 57- bursa copulatrix. *Myllocerus curvicornis* (Fabricius) 58- aedeagus, 59- apical end penis, 60- endophallic armature, 61- spermatheca. 62- bursa copulatrix.

margin strongly sclerotized ; *endophallus* (Fig. 60) internal sac cylindrical, narrow, elongated ; armature well developed, present all along the length in the form of obliquely arranged dense chitinous spines ; apical margin hooked, a number of denticles present

apically. *Spermatheca* (Fig. 61) ramus bulbous, hooked, collum reduced papillae like, cornu narrow, medium sized almost 'L' shaped, moderately chitinized; *bursa copulatrix* (Fig. 62) club shaped, apical margin irregular, stalk like base, 2 weakly chitinized patches present.

14. *Myllocerus subfasciatus* Guerin, 1843  
(Fig. 63-68)

*Myllocerus subfasciatus* Guerin, 1843 *Voy. Deless*, 2 : 54.



Figs. 63-72 : *Myllocerus subfasciatus* Guerin : 63- aedeagus, 64- distal end penis, 65- internal sac, 66- apical end internal sac, 67- endophallic armature, 68- spermatheca, *Myllocerus andrewesi* Marshall, 69- aedeagus, 70- endophallic armature, 71- apical end—internal sac, 72- spermatheca.

*Aedeagus* (Fig. 63) medium, weakly sclerotized, subcylindrical apically, apical margin weakly convex, ostium reduced, *endophallus* (Figs. 65-67) well developed, undulating, elongated, narrow apically, endophallic armature present in the form of loosely coiled lateral bands (Figs. 65 & 67) arranged almost throughout the length of the sac, each band comprising obliquely arranged chitinous plates ; a bunch of denticles present in the apical half. *Spermatheca* (Fig. 68) strongly sclerotized ; ramus reduced, knob like, collum rudimentary tubercle like, cornu moderate, curved "V" shaped, truncate at margin.

15. *Myllocerus andrewesi* Marshall, 1916  
(Figs. 69-72)

*Myllocerus andrewesi* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 346-347.

*Aedeagus* (Fig. 69) medium sized, weakly sclerotized, apophyses rather long, basal piece weak, penis subcylindrical apically ; apical margin moderately convex, ostium medium sized ; *endophallus* (Figs. 70 & 71) cylindrical, thin and long, strongly chitinized, armature in the form of patches of obliquely arranged longitudinal plates, tuberculated in apical half, apical margin spiniculate. *Spermatheca* (Fig. 72) ramus bulbous, twisted over the body, collum reduced papillae like, cornu rather small, strongly curved, hooked at apical end.

16. *Myllocerus discolor* Boheman 1834  
(Figs. 73-76)

*Myllocerus discolor* Boheman, 1834, *Schonh, Gen. Curc. 5* : 428.

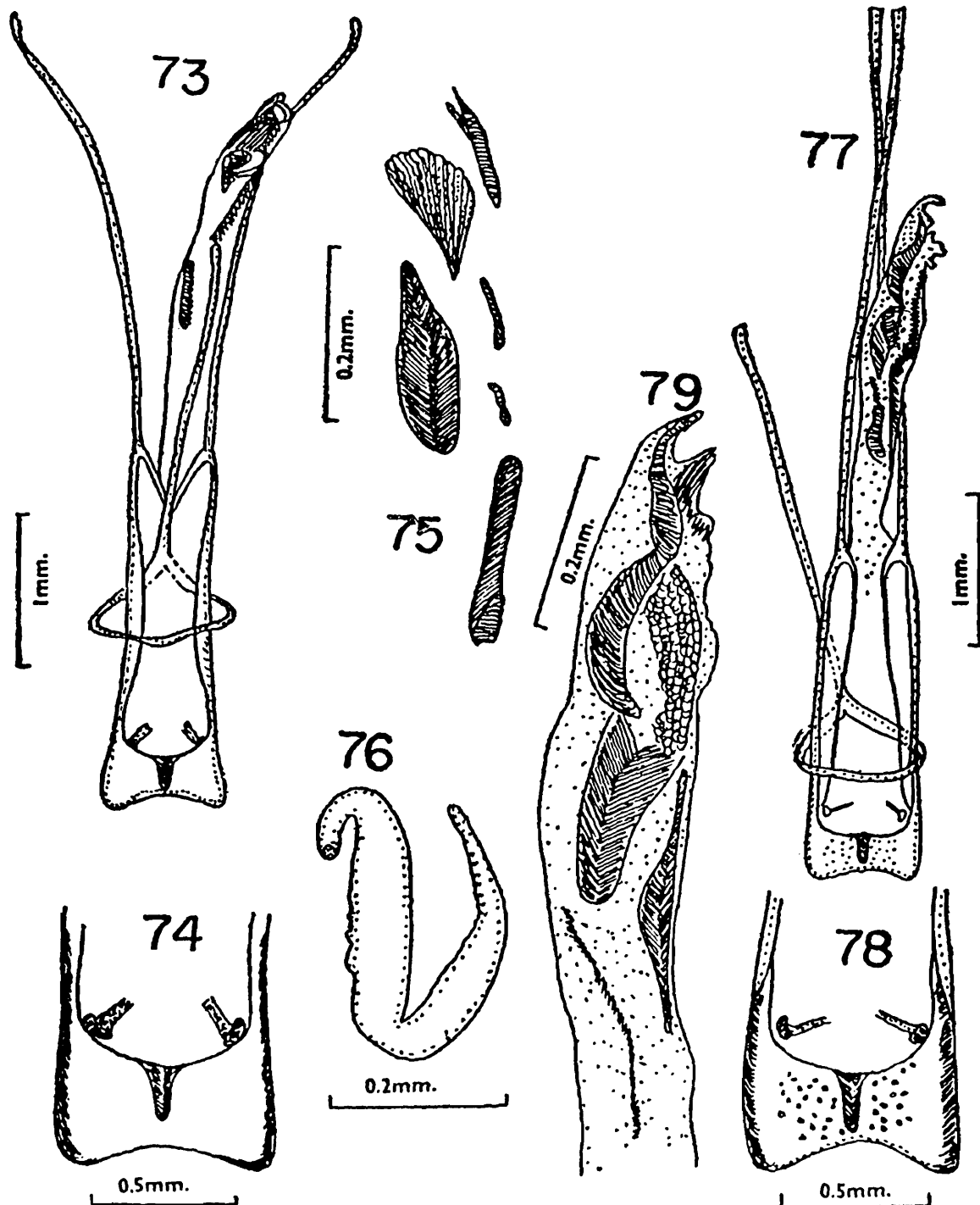
*Aedeagus* (Figs. 73 & 74) medium sized, strongly sclerotized, penis subcylindrical in apical half, moderately curved apically, apophyses medium sized, manubrium medium ; *endophallus* (Fig. 75) rather small, tubercular, armature generally confined to apical half, present in the form of leaf shaped patches, scattered chitinous plates closely packed ; *spermatheca* (Fig. 76) medium sized, ramus inverted 'U' shaped, collum reduced, papillate, cornu strongly curved, thin, tapering.

17. *Myllocerus discolor* var. *uniformis* Marshall, 1916  
(Figs. 77-79)

*Myllocerus discolor* var. *uniformis* Marshall, 1916 *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 349-350.

*Aedeagus* (Fig. 77) medium sized, sclerotized, penis subcylindrical in apical half,

apical margin moderately curved, apophyses medium, ostium not extending up to the apical margin of penis (Fig. 78); *endophallus* (Fig. 79) internal sac small, cylindrical, moderately chitinized; armature present in the form of wavy longitudinal bands, each band comprises



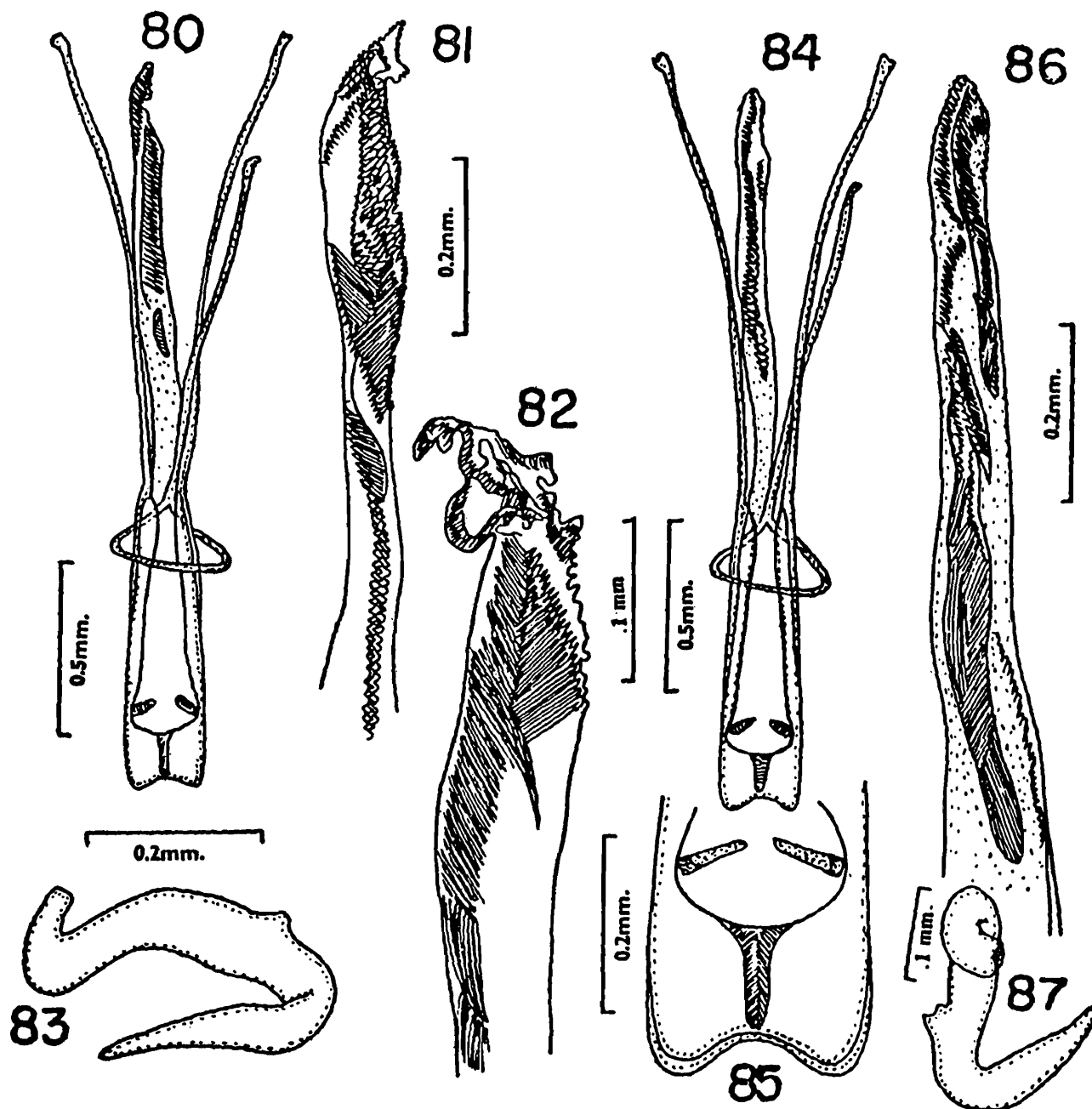
Figs. 73-79: *Myllocerus discolor* Boheman: 73- aedeagus, 74- apical end penis, 75- endophallic armature, 76- spermatheca; *Myllocerus discolor uniformis* Marshall, 77- internal sac, 78- apical end penis, 79- internal sac.

obliquely arranged chitinous plates, a patch of chitinous tubercles present in the apical half, apical margin divided like fingers.

18. *Myllocerus 11-pustulatus* Faust, 1891  
(Figs. 80-83)

*Myllocerus 11-pustulatus* Faust, 1891, *Stett. Ent. Zeit.* : 266.

*Aedeagus* (Fig. 80) rather small, weakly sclerotized, penis almost flattened, apical margin weakly curved, manubrium thin, long, ostium extending up to apical margin ; *endo-*



Figs. 80-87 : *Myllocerus 11-pustulatus* Faust : 80- aedeagus, 81- internal sac, 82- endophallic armature, 83- spermatheca *Myllocerus 11-pustulatus marmoratus* Faust : 84- aedeagus, 85- apical end penis, 86- endophallic armature, 87- spermatheca:

*phallus* (Figs. 82 & 83) internal sac elongated and cylindrical, *endophallic armature* well developed, a median row of obliquely arranged chitinous spines present in distal half, additionally chitinized tubercles present apically, apico-lateral margin serrated. *Spermatheca* (Fig. 83) capsule moderately sclerotized, ramus well developed curved like a beak, collum reduced rather distally placed from ramus, cornu moderately 'V' shaped, tapering.

19. *Mylocerus 11-pustulatus marmoratus* Faust, 1897  
(Figs. 84-87)

*Mylocerus marmoratus* Faust, 1897, *Dent. Ent. Zeit.*, : 360.

*Mylocerus 11-pustulatus* var. *marmoratus*, 1916, *Fauna Brit. India, Coleoptera (Rhychophora: Curculionidae)*: 352.

*Aedeagus* (Fig. 84) small, weakly sclerotized, penis flat, subcylindrical apically, apical margin moderately curved, ostium extending almost up to the margin, manubrium thin and long; *endophallus* (Fig. 86), internal sac thin, elongated and cylindrical almost uniformly broad, armature developed, present in the form of long chitinous bands along the whole length of the sac, each band comprises closely arranged oblique chitinous plates. *Spermatheca* (Fig. 87) capsule sclerotized, ramus well developed twisted over the body, collum medium, margin sinuate, cornu small, curved 'V' shaped.

20. *Mylocerus kashmirensis* Marshall, 1916  
(Figs. 88-92)

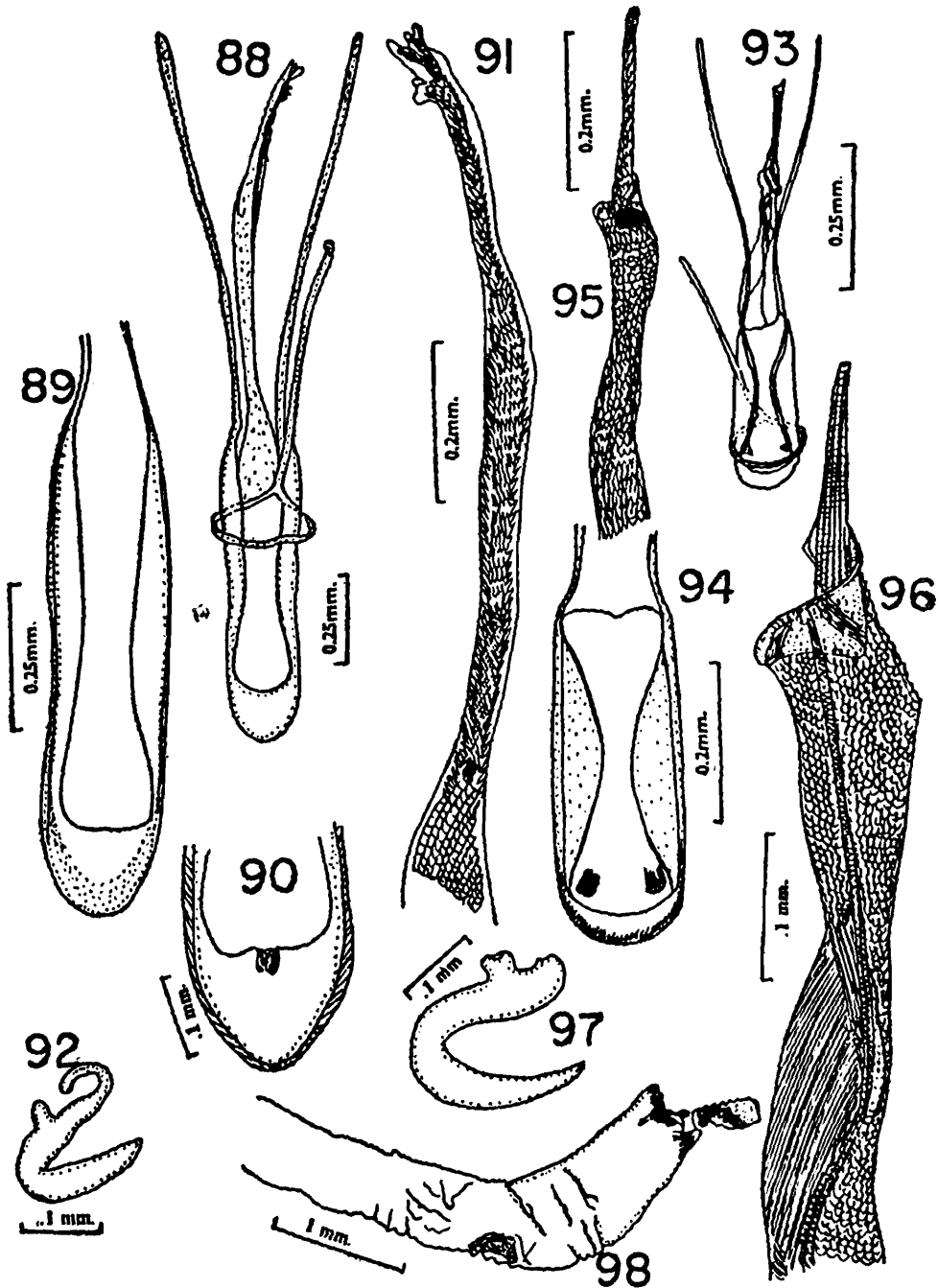
*Mylocerus kashmirensis* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora: Curculionidae)*: 308.

*Aedeagus* (Figs. 88-90) rather small, strongly sclerotized, penis broader both distally and apically, apical margin strongly convex, ostium rudimentary, basal piece weak, manubrium medium, *endophallus* (Fig. 91) internal sac, elongated ribbon like, strongly chitinized, armature present in the form of closely arranged transverse rows of spines throughout the length of the sac, a patch of chitinous plates present at the base. *Spermatheca* (Fig. 92) rather small but well sclerotized, ramus thin curved like a hook, collum well developed, knob like, cornu rather small, 'V' shaped.



21. *Mylocerus ignavus* Marshall, 1916  
(Figs. 93-98)

*Mylocerus ignavus* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychoptera : Curculionidae)*: 312.



Figs. 88-98 : *Mylocerus kashmirensis* Marshall : 88- aedeagus ; 89- penis ; 90- apical end penis ; 91- endophallic armature ; 92- spermatheca ; *Mylocerus ignavus* Marshall ; 93- aedeagus ; 94- penis ; 95- internal sac ; 96- endophallic armature ; 97- spermatheca ; 98- bursa copulatrix.

*Aedeagus* (Fig. 93) much small, weakly sclerotized, penis uniformly broad, subcylindrical, apical margin semi-circular, ostium reduced (Fig. 94) basal piece weak, manubrium reduced, apophyses long; *endophallus* (Figs. 95 & 96) internal sac spathe like, flattened, apical margin projecting like a finger, strongly chitinized, rows upon rows of chitinous tubercles present throughout its length. *Spermatheca* (Fig. 97) ramus reduced, truncate, collum medium sized, knob like, cornu medium sized, tapering apically, broadly 'V' shaped; *bursa copulatrix* (Fig. 98) club shaped, cylindrical, sinuate laterally, chitinous portion rudimentary.

## 22. *Mylocerus setulifer* Desbr. 1898

(Figs. 99-102)

*Mylocerus setulifer* Desbr., 1899, *Indian Mus. notes*, 4 : 111.

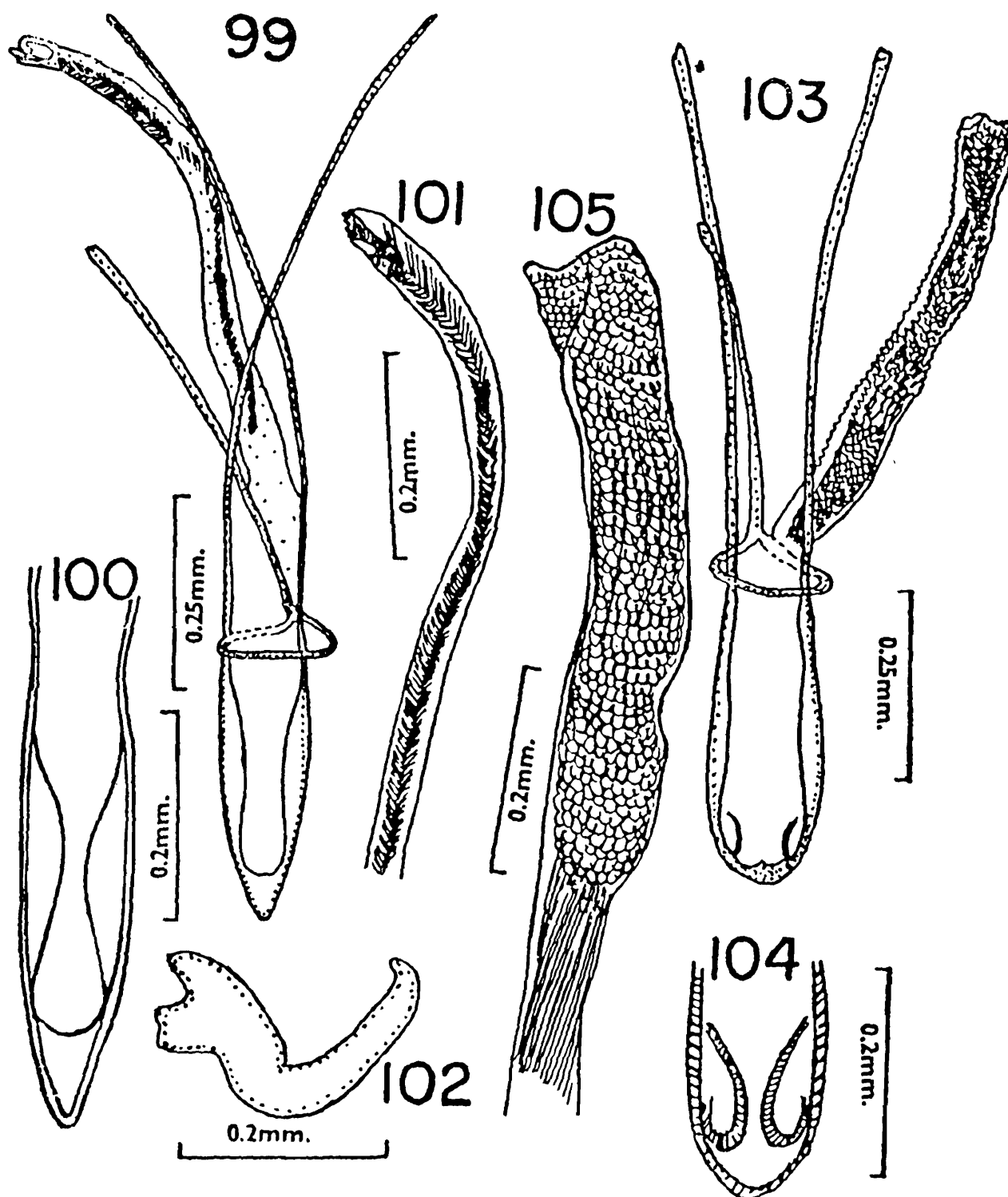
*Aedeagus* (Fig. 99) weakly sclerotized, penis reduced, apophyses at least two times as long as penis, manubrium long, ostium reduced; penis with apical margin much elongated, widest at the middle, tapering towards both ends; *endophallus* (Fig. 101) internal sac chord like, elongated, uniformly chitinized throughout its length, endophallic armature present in the form of obliquely arranged bipinnate plates. *Spermatheca* (Fig. 102) ramus conical, collum knob like, weakly bisinuate, cornu medium sized, hooked at apical end, strongly sclerotized.

## 23. *Mylocerus lineatocollis* Boheman, 1843

(Figs. 103-105)

*Mylocerus lineatocollis* Boheman, 1843, *Gen. Curc.*, 7 (1): 23.

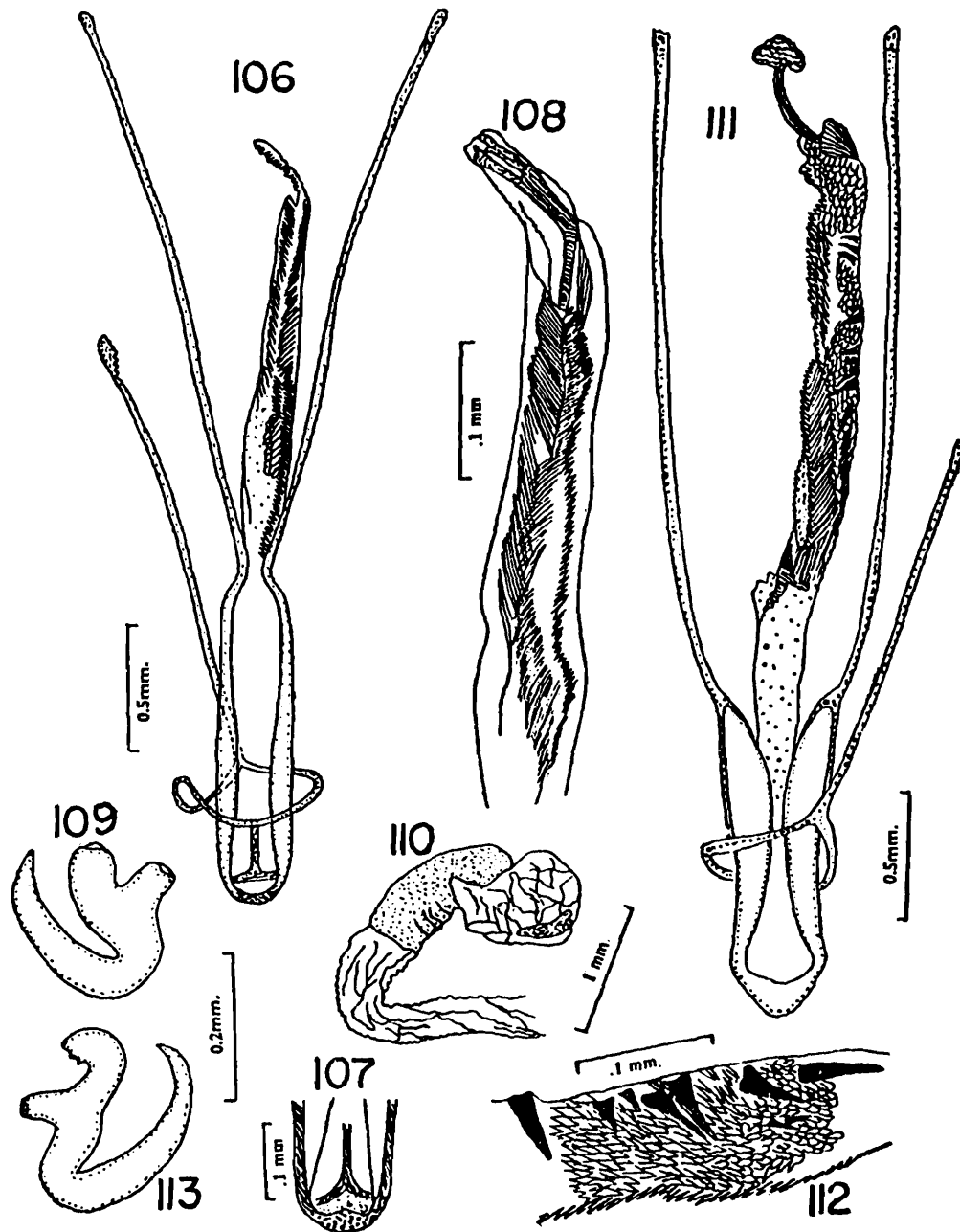
*Aedeagus* (Fig. 103) weakly sclerotized, penis reduced, flattened, laterally substraight, apically strongly convex, apophyses long, basal piece weak, manubrium medium; *endophallus* (Fig. 105) internal sac flattened ribbon like, densely chitinized throughout its length, endophallic armature in the form of transversally arranged rows upon rows of chitinous tubercles of uniform intensity.



Figs. 99-105 : *Myllocerus setulifer* Desbrochers : 99- aedeagus ; 100- penis ; 101- endophallic armature ; 102- spermatheca. *Myllocerus lineatocollis* Boheman ; 103- aedeagus ; 104- apical end penis ; 105- endophallic armature.

24. *Mylocerus crinitus* Marshall, 1916  
(Figs. 106-110)

*Mylocerus crinitus* Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 322.



Figs. 106-113 : *Mylocerus crinitus* Marshall : 106- aedeagus ; 107- apical end penis ; 108- endophallic armature ; 109- spermatheca ; 110- bursa copulatrix. *Mylocerus dorsatus* Fabricius ; 111- aedeagus ; 112- endophallic armature ; 113- spermatheca.

*Aedeagus* (Figs. 106 & 107) moderately sclerotized ; penis well developed, sclerotized, laterally sub parallel, apically strongly convex basal piece well developed, manubrium long,

apical margin serrated ; *endophallus* (Fig. 108) internal sac tubular, elongated, moderately chitinized almost throughout its length, endophallic armature in the form of a band of obliquely arranged chitinous spines, margin serrated, hooked apically. *Spermatheca* (Fig. 109) with both ramus and collum well developed, tuberos, arranged in 'V' shape ; cornu arcuate. *Bursa copulatrix* (Fig. 110) club shaped, medium sized, chitinous patch distinct.

25. *Myllocerus dorsatus* (Fabricius, 1798)  
(Figs. 111-113)

*Curculio dorsatus* Fabricius, 1798, *Ent. Syst. Suppl.* 1173.

*Myllocerus dorsatus*, Marshall, 1916, *Fauna Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 320.

*Aedeagus* (Fig. 111) medium sized, moderately sclerotized, arcuate, penis flattened distally, apical margin strongly convex, laterally sub-parallel, ostium reduced, basal piece medium sized, apophyses long, thin ; *endophallus* (Figs. 111 & 112) subcylindrical, laterally sinuate, thickly chitinized, a club shape projection at the apical end, endophallic armature comprises transversally arranged chitinized tubercles, thorny chitinous structures present in between (Fig. 112). *Spermatheca* (Fig. 113) half hooked, margin sinuate, collum well developed, protruding, knob like, cornu strongly arcuate.

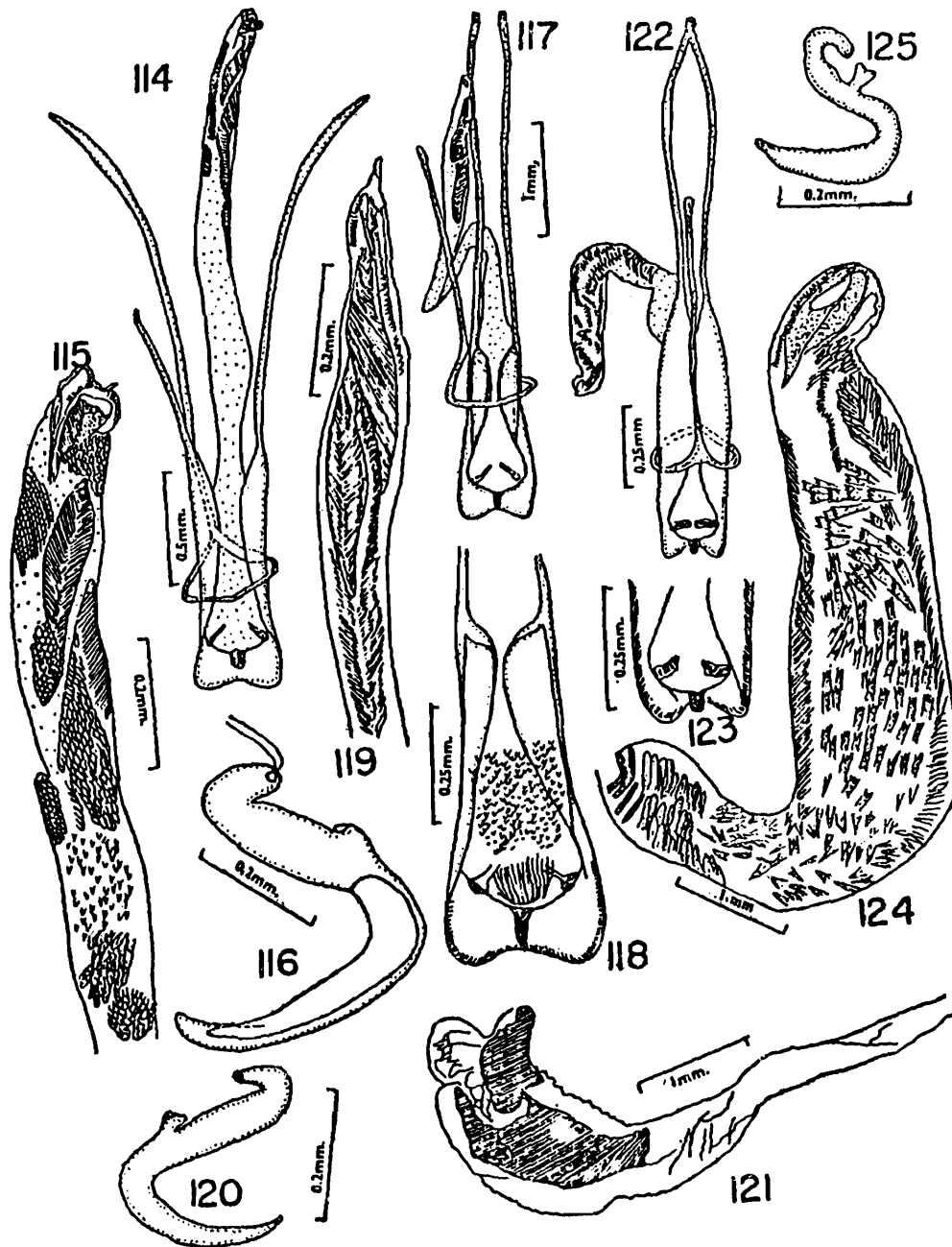
26. *Myllocerus impressicollis* Marshall, 1916  
(Figs. 114-116)

*Myllocerus impressicollis* Marshall, 1916, *Faun. Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 331.

*Aedeagus* (Fig. 114) medium sized, weakly sclerotized, subcylindrical, apical margin curved, ostium reduced, basal piece and manubrium medium, apophyses strongly diverging, long ; *endophallus* (Fig. 115) internal sac cylindrical, elongated, moderately chitinized, endophallic armature varying in shape such as chitinized plates, papillae, scales and tubercles, each arranged in distinct patches along the length of sac. *Spermatheca* (Fig. 116) rather large, body strongly sclerotized, ramus well formed, vertical hook like, collum reduced, tuberos, cornu weakly arcuate, almost at 'U' angle.

27. *Mylocerus echinarius* Marshall, 1916  
(Figs. 117-121)

*Mylocerus echinarius* Marshall, 1916, *Faun. Brit. India, Coleoptera (Rhychophora : Curculionidae)* : 332.



Figs. 114-125 : *Mylocerus impressicollis* Marshall: 114- aedeagus; 115- endophallic armature; 116- spermatheca *Mylocerus echinarius* Marshall: 117- aedeagus; 118- penis; 119- endophallic armature; 120- spermatheca; 121- bursa copulatrix. *Mylocerus suspicieus* Marshall: 122- aedeagus; 123- apical end penis; 124- endophallic armature; 125- spermatheca.

*Aedeagus* (Figs. 117 & 118) well formed, strongly sclerotized, penis arcuate, widest apically, apical margin strongly curved, thickly chitinized, ostium well developed, apophyses medium, almost sub-parallel, *endophallus* (Fig. 119) internal sac spindle shaped, thickly chitinized throughout its length, endophallic armature in the form of two distinct spindle shaped patches of obliquely arranged bipinnate chitinized plates in the upper half, serrated apically. *Spermatheca* (Fig. 120) ramus pointed, hook like, collum reduced, knobbed, obliquely directed, cornu medium, weakly arcuate, broad 'V' shaped ; moderately sclerotized. *Bursa copulatrix* (Fig. 121) elongated sac like, comprises a large chitinized patch, arcuate laterally.

## 28. *Myllocerus suspiciens* Marshall, 1916 (Figs. 122-125)

*Myllocerus suspiciens* Marshall, 1916, *Faun. Brit. India, Coleoptera (Rhynchophora : Curculionidae : 306.*

*Aedeagus* (Figs. 122 & 123) rather small, weakly sclerotized, penis flattened, apical margin strongly curved, broadest in the middle, ostium well developed extending beyond the apical margin, apophyses rather small, curved apically ; *endophallus* (Fig. 124) internal sac cylindrical, sac like, bulbous at both ends, thickly chitinized, endophallic armature in the form of scattered pectinate spines at the centre of the internal sac, while chitinous papillae present both apically and distally, apical margin serrated. *Spermatheca* (Fig. 125) body weakly sclerotized, bulbous, ramus inverted 'V' shaped, collum tuberos, cornu gently arcuate, broadly 'V' shaped.

## TAXONOMIC IMPORTANCE OF GENITALIA WITHIN GENUS *MYLLOCERUS* SCHONHERR

Marshall (1916) recorded 71 species of Genus *Myllocerus* from the Indian subregion and defined it as a somewhat large and heterogenous genus which requires subdivision. He opined that a number of additional characters may have to be studied for this purpose. His key for identification of the Indian species is based on various combinations of characters. With a view to facilitate the identity of the large number of species of this complex genus, taxonomic importance of the genitalia has been discussed here. Recently Kumar & Sen-Sarma (1974) described the genitalia of 16 Indian species of tribe Cyphicerinii of this family and studied its taxonomic importance. Based on the present study of the male and female genitalia of the 28 species of *Myllocerus*, it is noted that this is a very useful taxonomic character even in large genus like *Myllocerus*,

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PLATE 1

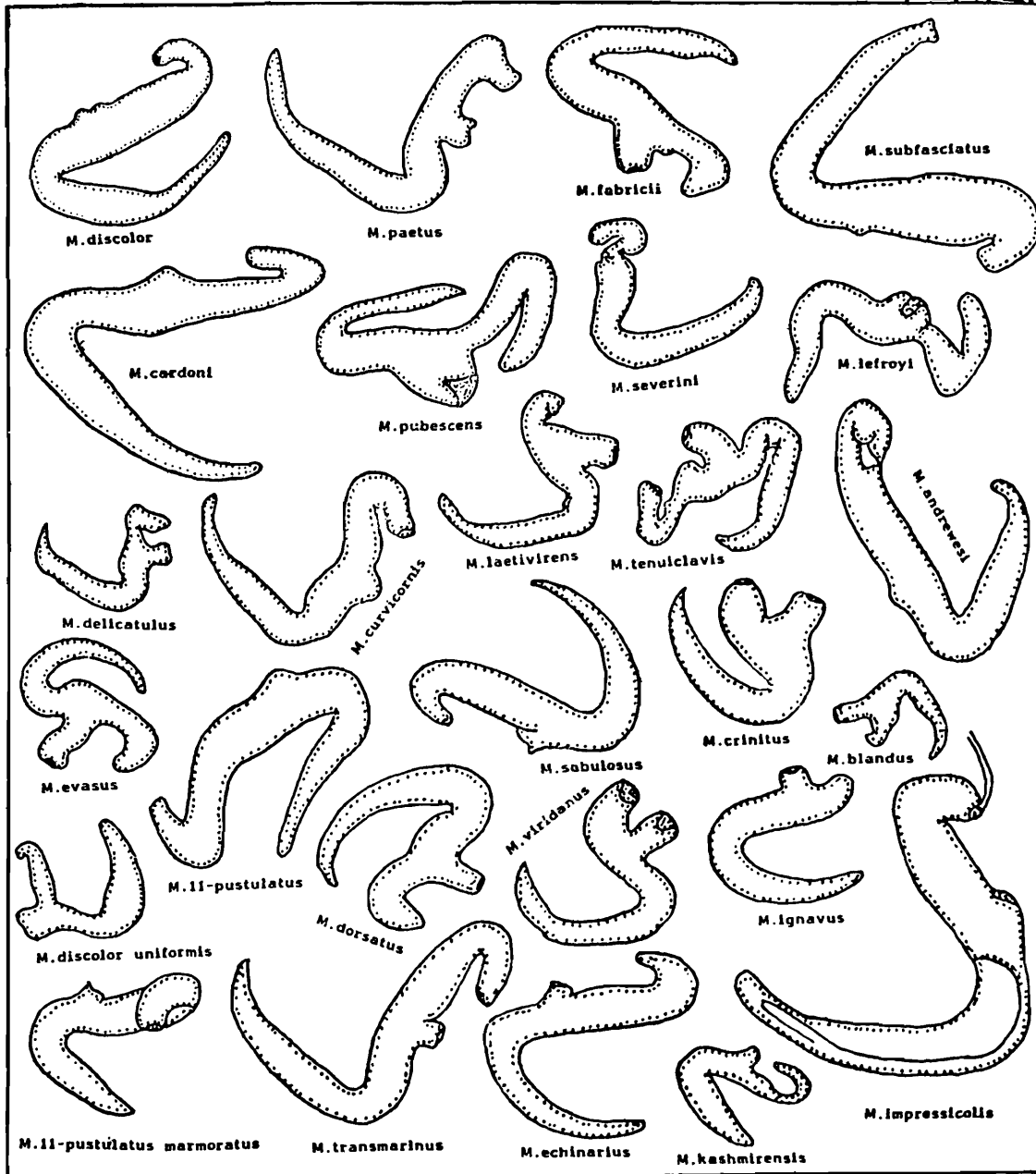


PLATE 1 : Spermatheca of different species of genus *Myllocerus* Schn.



**Male genitalia** : on the basis of shape of penis, the taxa studied can be distinctly grouped into two, (1) with the apical margin of penis strongly convex (e. g. *Mylocerus kashmirensis*, *M. ignavus*, *M. setulifer*, *M. lincatocollis*, *M. crinitus* and *M. dorsatus*), (2) the remaining species can be put in the second group in which the apical margin of penis is bisinuate. This grouping broadly tallies with Marshall's (1916) subgroup of the species of *Mylocerus* on the basis of bisinuate or truncate prothorax.

The endophallic armature is clearly distinct in its shape, structure and distribution and is characteristic for each species, thus should alone be sufficient to identify the males of the species.

**Female genitalia** : sclerotized body of *spermatheca* is again very distinct in shape and size for each species (Plate 1). It shows a fascinating range of structural variations in its shape in different species and the spermatheca of one species can not be confused with another in the material studied. The shape of ramus, collum and cornu all demonstrate very distinct variations. Aslam (1961) has also shown it as an excellent taxonomic character in family Curculionidae.

The *bursa copulatrix* also varies distinctly in its shape and size in different species studied,

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#### SUMMARY

Male and female genitalia of 28 Indian species of genus *Mylocerus* Schonherr have been described and illustrated. *Aedeagus* is typically annulate type ; female genitalia is tubular type ; *spermatheca* is sclerotized and *bursa copulatrix* is well developed. Shape of penis, pattern of endophallic armature, shape of spermatheca and bursa copulatrix are very useful characters to separate the species.

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