

OCCASIONAL PAPER No. 295

**Records of the
Zoological Survey of India**

**Dung Beetles (Coleoptera : Scarabaeidae :
Coprinae) of Thar Desert of Gujarat**

RAM SEWAK

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**DUNG BEETLES (COLEOPTERA : SCARABAEIDAE :
COPRINAE) OF THAR DESERT OF GUJARAT**

RAM SEWAK

*Desert Regional Station, Zoological Survey of India, Pali Road,
Jhalamand, Jodhpur-342 005 (Rajasthan)*

Edited by the Director, Zoological Survey of India, Kolkata



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INTRODUCTION

The Indian Thar Desert is restricted to thirteen districts of Rajasthan, ten districts of Gujarat, four districts of Haryana and three districts of Panjab states, but the present study pertains to Thar Desert of Gujarat. The dung beetles are very interesting insects belonging to subfamily Coprinae (Scarabaeidae). They play very important role in pasture ecosystem, environment and national economy. They break down tons of animal dung every day into nodules or balls, roll them into subterranean chambers or tunnels of the soil to be buried and degraded into the soil to increase the fertility of the soil, by doing so they also destroy the habitat for the larvae of many pest flies of domestic animals, which they lay eggs in the dung. Some of them are the intermediate hosts for the parasites of domestic and wild animals.

Arrow (1931) published a fauna volume on Indian Coprinae in the series "Fauna of British India" Unfortunately, not a single species have been reported from Gujarat. Balthasar (1963) also published the monographs on Scarabaeidae of Palaearctic and Oriental Region. Biswas (1978a and 1978b), Biswas and Chatterjee (1985), Biswas et al (1997). Chatterjee and Biswas (1995, 2000, 2003, 2004) studied the Scarabaeidae fauna of Arunachal Pradesh, West Bengal, Delhi, Meghalaya, Tripura, Sikkim, Manipur. Sewak (1985, 1986, 1991, 2004, 2005 and 2006) worked out the Coprinae fauna of Gujarat, Uttar Pradesh, Arunachal Pradesh and Rajasthan.

The present study is based on the collection of dung beetles, collected from Ahmedabad, Banaskantha, Jamnagar, Junagarh, Kutch, Mahesana, Patan, Porbandar, Rajkot and Surendernagar districts of Thar Desert of Gujarat. The districts Banaskantha, Mahesana, Rajkot and Junagarh are partly under desert.

SYSTEMATIC ACCOUNT OF DUNG BEETLES

Class INSECTA

Order COLEOPTERA

Suborder POLYPHAGA

Superfamily SCARABAEOIDEA

Family SCARABAEIDAE

Subfamily COPRINAE

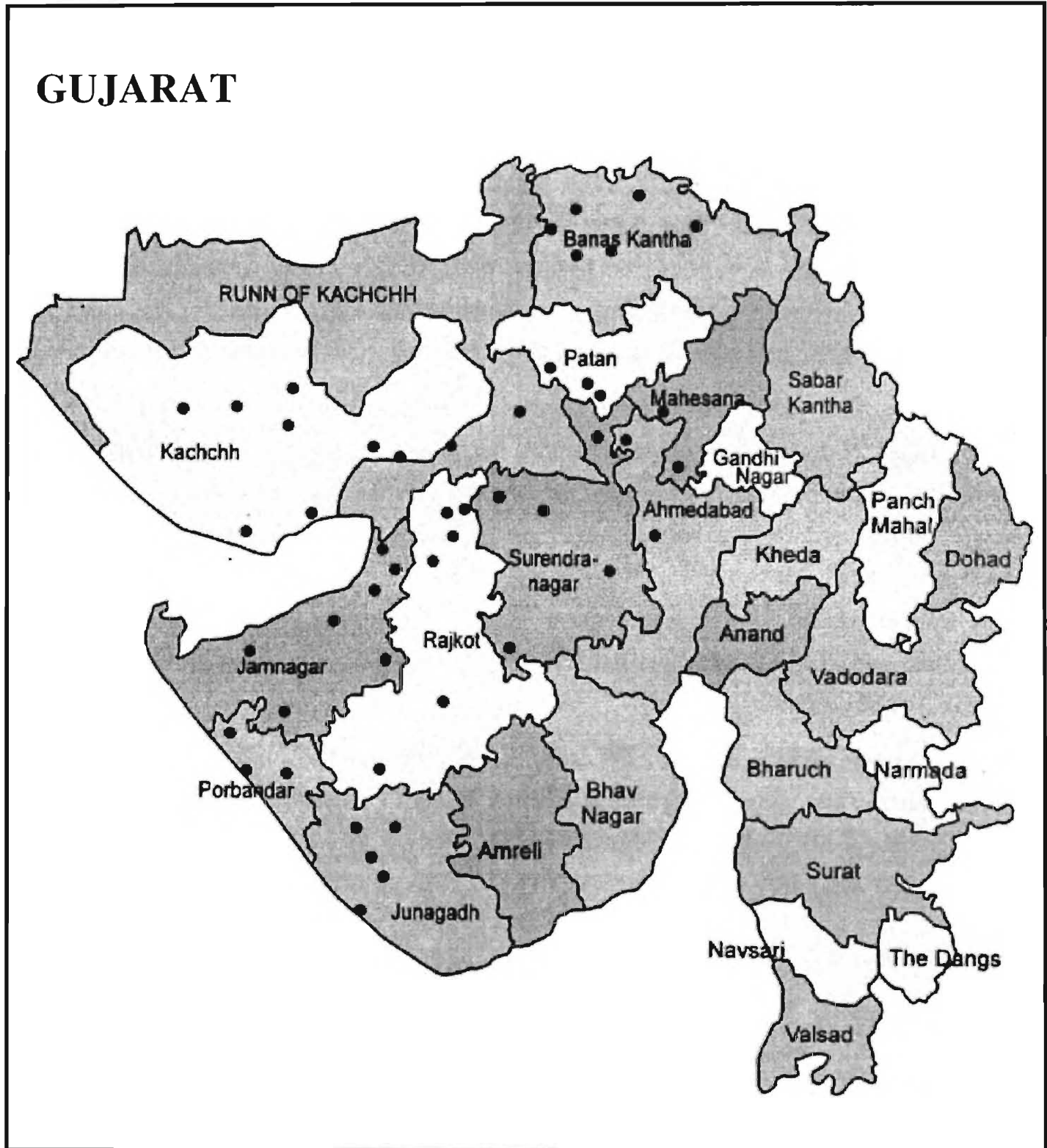


Fig. 1 : Map of Gujarat Showing Study Sites

CLASSIFIED LIST OF DUNG BEETLES

Tribe I SCARABAEINI

1. Genus *Gymnopleurus* Illiger

1. *Gymnopleurus cyaneus* (Fabricius)
2. *Gymnopleurus miliaris* (Fabricius)
3. *Gymnopleurus gemmatus* Harold*

Tribe II COPRINI

2. Genus *Heliocopris* Hope

4. *Heliocopris gigas* (Linnaeus)*

3. Genus *Catharsius* Hope

5. *Catharsius platypus* Sharp*
6. *Catharsius sagax* (Quenstedt)*
7. *Catharsius pithecius* (Fabricius) *

4. Genus *Copris* Geoffroy

8. *Copris indicus* Gillet
9. *Copris repertus* Walker*
10. *Copris delicatus* Arrow*
11. *Copris corpulentus* Gillet
12. *Copris numa* Lansberge
13. *Copris cribratus* Gillet*
14. *Copris furciceps* Felsche*

5. Genus *Phalops* Erichson

15. *Phalops candenzei* Lansberge*
16. *Phalops divisus* (Wiedmann)*
17. *Phalops cyanescens* (D'Orbigny)
18. *Phalops olivaceus* Lansberge

6. Genus *Caccobius* Thomson

19. *Caccobius diminutivus* (Walker)*
20. *Caccobius torticornis* Arrow*
21. *Caccobius inermis* Arrow*
22. *Caccobius meridionalis* Boucomont*
23. *Caccobius vulcanus* (Fabricius)*
24. *Caccobius indicus* Harold
25. *Caccobius pantherinus* Arrow*
26. *Caccobius denticollis* Harold*

7. Genus *Onthophagus* Latreille

27. *Onthophagus ochreatus* D'Orbigny*
28. *Onthophagus oculatus* Arrow
29. *Onthophagus dynastoides* Arrow*
30. *Onthophagus variegatus* (Fabricius)*
31. *Onthophagus fuscopunctatus* (Fabricius)*
32. *Onthophagus orientalis* Harold*
33. *Onthophagus productus* Arrow
34. *Onthophagus catta* (Fabricius)
35. *Onthophagus bonasus* (Fabricius)*
36. *Onthophagus seniculus* Fabricius
37. *Onthophagus madoqua* Arrow*
38. *Onthophagus violaceotinctus* Gillet*
39. *Onthophagus rana* Arrow
40. *Onthophagus kuluensis* Bates*

41. *Onthophagus armatus* Blanchard*
42. *Onthophagus semicinctus* D'Orbigny*
43. *Onthophagus triceratops* Arrow*
44. *Onthophagus politus* (Fabricius)
45. *Onthophagus ensifer* Boucomont*
46. *Onthophagus frugivorus* Arrow*
47. *Onthophagus cervus* (Fabricius)
48. *Onthophagus falsus* Gillet

8. Genes *Oniticellus* Serville

49. *Oniticellus pallipes* (Fabricius)*
50. *Oniticellus pallens* (Olivier)*
51. *Oniticellus spinipes* Roth*
52. *Oniticellus cinctus* (Fabricius)

9. Genus *Drepanocerus* Kirby

53. *Drepanocerus sinicus* Harold*
54. *Drepanocerus runicus* Arrow*
55. *Drepanocerus exsul* (Sharp)

10. Genus *Onitis* Fabricius

56. *Onitis siva* Gillet*
57. *Onitis lama* Lansberge*
58. *Onitis falcatus* (Wulfen)
59. *Onitis philemon* Fabricius

11. Genus *Chironitis* Lansberge

60. *Chironitis indicus* Lansberge

* Reported for the first from Thar Desert of Gujarat.

Key to the tribes of Subfamily COPRINAE

1. Middle coxae not widely separated; middle tibia with one terminal spurs SCARABAEINI
- Middle coxae widely separated, middle tibia with two terminal spurs 2
2. Posterior legs extremely long, the tarsi filiform SISYPHINI
- Basal joint of the hind tarsus much longer than the second 3
3. Posterior legs not extremely long, tarsi more or less flat and tapering COPRINI
- Basal joint of the hind tarsus not much longer than the second PANELINI

Tribe 1 SCARABAEINI

Body rather depressed. Legs very slender, middle and hind tibiae narrow and dilated at each end, with a single terminal spur and tarsi filiform. Clypeus produced into two or more lobes at front margin and ocular lobes prominent. Male and female are generally alike. Tribe consist of two genera *Scarabaeus* and *Gymnopleurus*, but representative of *Scarabaeus* has not been recorded from Thar Desert of Gujarat.

Genus *Gymnopleurus* Illiger 1803

The three species of the genus *Gymnopleurus* have been recorded from Thar Desert of Gujarat.

Key to Species of Genus *Gymnopleurus*

1. Abdominal sides not carinate at the base, clypeus with four frontal teeth and dorsal surface without hairy clothing *cyaneus* (Fabricius)
- Dorsal surface with hairy clothing 2
2. Prothorax having a ring of five spots along with central one, two lateral and two basal spots *miliaris* (Fabricius)
- Clypeus with two frontal teeth, prothorex having about fifteen shining spots *gemmatus* Harold*

1. *Gymnopleurus cyaneus* (Fabricius)

1778. *Copris cyaneus* Fabricius, *Ent. Syst. Suppl.*, p. 34.

1931. *Gymnopleurus cyaneus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 49-50.

Diagnostic characters : Broadly oval, not very convex. Clypeus has four blunt teeth at front margin, sides of prothorax strongly rounded. Front femur has a tooth placed at two-third of its length from base. Middle tibia scarcely and hind tibia distinctly serrate. All tarsi present.

Distribution : India : Gujarat (Jamnagar), Andhra Pradesh, Haryana, Karnataka, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh, Sri Lanka.

2. *Gymnopleurus miliaris* (Fabricius)

1725. *Scarabaeus miliaris* Fabricius, *Syst. Ent., App.*, p. 817.

1931. *Gymnopleurus miliaris*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 50-51.

Diagnostic characters : Broadly oval, not very convex. Upper surface closely clothed with minute grey setae. Clypeus has four blunt lobes at front edge. Prothorax having a ring of five spots along with a centrally located spot, one on each side near lateral pit, two spots adjoining basal margin of each, one near middle and one upon apical callus. Front tibia armed with three external strong teeth, middle and hind tibiae coarsely serrate. Front femur has two sharp carinae along its anterior margin.

Distribution : India : Gujarat (Porbandar), Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh.

Elsewhere : Sri Lanka.

3. *Gymnopleurus gemmatus* Harold*

1871. *Gymnopleurus gemmatus* Harold, *Col., Hefte*, 8 : 117.

1931. *Gymnopleurus gemmatus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 53-54, Pl. III, Fig. 1.

1963. *Gymnopleurus* (s. str) *gemmatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 204-205, Fig. 2.

Diagnostic characters : Oval, not very convex. Upper surface closely clothed along with minute grey setae. Clypeus produced into two blunt lobes at front margin. Prothorax has several spots, a central spot, five adjoining front margin, four adjoining hind margin, three or four on each side, upon elytral suture, a common transverse irregular patch behind it just before apices, three spots adjoining basal margin on each side, one near middle of outer margin, one upon apical callus. Front tibia armed with three strong external teeth, middle and hind tibiae rather feebly toothed externally, front femur has a flattened anterior edge.

Distribution : India : Gujarat (Porbandar), Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu.

Elsewhere : Sri Lanka.

Tribe 2 COPRINI

Head, prothorax has horns, tubercles and carinae. Legs slender, middle and hind coxae far apart. Middle tibiae dilated towards extremity, middle tibiae with two and hind with one terminal spur. Middle and hind tarsi more or less flattened.

Tribe Coprini consists of the most commonly found dung beetles which are known with an ample of morphological variation in size and form. Total fifty seven species under ten genera, were collected from Thar Desert of Gujarat.

Key to genera of tribe COPRINI

1. Prothorax with one, elytra with two lateral carina, and first joint of antennal club shining *Heliocopris* Hope.
- Prothorax without carina and first joint of antennal club not shining 2
2. All three antennal club joints long and entirely pubescent, elytra with longitudinal carina *Catharsius* Hope
- Elytra without longitudinal carina 3
3. Prothorax with a strong basal median groove and elytra with one lateral carina *Copris* Geoffroy
- Prothorax without a strong basal median groove 4
4. Middle and hind tarsi broadly dilated *Phalops* Erichson
- Middle and hind tarsi not broadly dilated 5
5. Terminal margin of the front tibia of the at right angle to the inner margin and front angle of prothorax hollowed beneath *Caccobius* Thomson
- Terminal margin of the front tibia of not at right angle to the inner margin and front angle of prothorax not hollowed beneath 6.
6. Middle and hind tibiae dilated greatly from base to extremity *Onthophagus* Latreille
- Middle and hind tibiae slender and not dilated from base to extremity 7.

7. Sides of the abdomen exposed above *Oniticellus* Servielle
 — Sides of the abdomen not exposed above 8.
 8. Clypeus bidented and scutellum distinct *Drepanocerus* Kirby
 — Prothorax with two basal impression near the middle 9.
 9. Scutellum very minute and front tarsi absent in male and female *Onitis* Fabricius
 — Scutellum not very minute and front tarsi present in female *Chironitis* Lansberge

2. Genus *Heliocopriss* Hope 1837

The single species of the genus *Heliocopriss* have been found from Thar Desert of Gujarat.

4. *Heliocopriss gigas* (Linnaeus)*

1764. *Scarabaeus gigas* Linnaeus, *Mus. Lud. Ulr.*, p. 16.

1931. *Heliocopriss gigas*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 86, Pl. IV, Fig. 1-4.

1963. *Heliocopriss gigas*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 300-302, Pl. XII, Fig. 2.

Diagnostic characters : Broad, very convex. Clypeus hollowed, margin with two prominence on each sides. Prothorax broad, short with a steep anterior declivity. Elytra having sutural border, sutural region strongly rounded from base to apex. Pygidium smooth, shining with very sparse fine scattered punctures. Male has a pair of long slightly curved parallel cephalic horns on clypeal margin at junction of ocular lobes. Prothorax dorsally prouced forward in middle as a broad tapering horizontal processes. Female has a sharply elevated transverse cephalic carinae and prothorax with slight broadly rounded prominence in middle.

Distribution : India : Gujarat (Junagarh), Bihar, Karnataka, Rajasthan and Uttar Pradesh.

Elsewhere : Africa, Arabia, Egypt and Pakistan.

3. Genus *Catharsius* Hope 1837

The three species of the genus *Catharsius* have been recorded from the Thar Desert of Gujarat.

Key to the species of Genus *Catharsius*

1. Prothorax with distinct hind angles *platypus* Sharp*
 — Prothorax without distinct hind angles 2

2. Prothorax without lateral prominence on each side *sagax* (Quenstedt)*
 — Head very transverse, prothorax of male with two tubercles and granulate
 *pithecius* (Fabricius)*

5. *Catharsius platypus* Sharp*

1875. *Catharsius platypus* Sharp, *Col. Hefte*, 13 : 42.
 1931. *Catharsius platypus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 93-94, Pl. VIII, Fig. 1 and 2.
 1963. *Catharsius platypus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 313-314.

Diagnostic characters : Broad, very convex. Clypeus hollowed, margin with two prominence on each sides. Prothorax short, broad, with a steep anterior declivity bearing reddish hairs. Elytra having sutural border, sloping strongly from suture to each side, sutural region strongly rounded from base to apex. The metasternal shield densely clothed with hairs. In male, outer margin of clypeus at junction of ocular lobes produced upward as a pair of long slightly curved parallel cephalic horns, prothorax dorsally prouced forward in the middle as a broad tapering horizontal processes, truncated at its extremity. Female having a sharply elevated transverse cephalic carinae, prothorax with slight broadly rounded prominence in middle.

Distribution : India : Gujarat (Jamnagar, Junagarh), Rajasthan and Uttar Pradesh.

Elsewhere : Pakistan.

6. *Catharsius sagax* (Quenstedt)*

1842. *Copris sagax* Quenstedt, *Schönh. Syn., Ins.*, 1 : 43.
 1931. *Catharsius sagax*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 96-1 pl. VIII, fig. 3.
 1963. *Catharsius sagax*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 309-310.

Diagnostic characters : Closely similar to *Catharsius molossus* but smaller in size. Elytra less dull and sooty. Head has smooth shining area adjoining eyes on each side. Cephalic horn less erect and situated forward. Prothoracic declivity straight, front angles sharp but not all produced.

Distribution : India : Gujarat (Rajkot), Arunachal Pradesh, Bihar, Karnataka, Kerala, Maharastra, Rajasthan, Tamilnadu and Uttar Pradesh.

Elsewhere : Sri Lanka.

7. *Catharsius pithecius* (Fabricius)*

1775. *Scarabaeus pithecius* Fabricius, *Syst. Ent.*, 21.

1931. *Catharsius pithecius*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 100-101, pl. VII, fig. 1 and 2.

1963. *Catharsius pithecius*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1: 312-313, pl. XV, fig. 2.

Diagnostic characters : Shortly oval, very convex. Head nearly semicircular, clypeus feebly excised in middle, having nearly straight, slendered horn arising just in front of eyes in male, slighty acuminate transverse elevation in female. Prothorax has a slight, sharp, conical protuberance on each side of median groove in male. Metasternal shield acutely angular in front, very smooth, shining along with median groove.

Distribution : India : Gujarat (Ahemdabad, Kuchchh, Patan, Mahesana, Surendranagar), Arunachal Pradesh, Bihar, Karnataka, Kerala, Maharastra, Rajasthan, Tamil Nadu and Uttar Pradesh.

Elsewhere : Sri Lanka.

4. Genus *Copris* Geoffroy, 1762

The seven species of the genus *Copris* have been found from Thar Desert of Gugarat.

Key to the species of genus *Copris*

1. Very shining and the front ngles of prothorax are very blunt *indicus* Gillet
- Prothorax with a longitudinal groove 2
2. Prothorax with sharp front angles and elytra feebly striate *repertus* Walker*
- Prothorax without sharp front angles and elytra not feebly striate 3
3. Prothorax with distinct front angles and elytra strongly striate *delicatus* Arrow*
- Prothorax with strongly punctured front angles 4
4. Elytra lightly striate *corpulentus* Gillete
- Prothorax not entirely nor evenly punctured 5
5. Clypeus feebly notched and elytra deeply striate *numa* Lansberge
- Clypeal margin without any process 6
6. Prothorax and elytra strongly punctured *cribratus* Gillet*
- Prothorax, elytra and metasternal shield well punctured *furciceps* Felsche*

8. *Copris indicus* Gillet

1910. *Copris indicus* Gillet, *Notes Leyed. Mus.*, 32 : 5.

1931. *Copris indicus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 106-107, pl. X, fig. 6.

Diagnostic characters : Broadly oval, highly convex. Head semicircular, clypeal margin feebly bilobed in middle. Sides of prothorax nearly straight in front, strongly rounded behind, front angles broadly truncate and hind angles very obtuse. Front tibia broad, armed with four blunt external teeth, terminal spur bented tip at right angles. Male has a short erect, flattened median cephalic horn, feebly bicuspid at extremity, prothorax with dorsal straight prominence along with lateral tubercle on each side. Female bears a slight transverse cephalic elevation.

Distribution : India : Gujarat (Kuchchh), Arunachal Pradesh, Karnataka, Kerala, Rajasthan and Tamil Nadu.

Elsewhere : Sri Lanka.

9. *Copris repertus* Walker*

1858. *Copris repertus* Walker, *Ann. Mag. Nat. Hist.*, 3(2) ; 208.

1931. *Copris repertus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 126-127, pl. X, figs. 8 and 9.

1963. *Copris repertus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae deŕ Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 351-352.

Diagnostic characters : Broadly oval, highly convex, covered with reddish bristles beneath. Head semicircular, clypeus deeply notched middle. Prothorax strongly grooved longitudinally in middle, front angles truncate and hind angles almost obsolete. Front tibia broad, armed with four nearly straight external teeth. Male bears a slendered slightly compressed erect cephalic horn along with a minute tooth near base on each side and female with short transverse elevated cephalic carina.

Distribution : India : Gujarat (Banaskantha, Kuchchh, Junagarh, Mahesana, Patan, Porbandar), Arunachal Pradesh, Bihar, karnataka, Maharastra, Madhya Pradesh, Pondicherry, Rajasthan, Tamil Nadu and Uttar Pradesh.

Elsewhere : China, Myanmar and Sri Lanka.

10. *Copris delicatus* Arrow*

1931. *Copris delicatus* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 117-118.

1963. *Copris delicatus* Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 347-348.

Diagnostic characters : Oblong oval, very convex. Clypeus smooth, broadly deeply excised in middle, having few punctures. Prothorax strongly closely punctured, with a deep median groove. Front angles blunt and hind angles obsolete. Elytra deeply striate, stria strongly, closely punctured, intervals convex, minutely sparsely punctured. Metasternal shield has a deep pit and median groove. Male has a long slender, compressed cephalic horn and female with small tubercle.

Distribution : India : Gujarat (Ahemdabad), Assam, Rajasthan and West Bengal.

11. *Copris corpulentus* Gillet

1910. *Copris corpulentus* Gillet, *Notes. Leyden Mus.*, 32 : 118.

1931. *Copris corpulentus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 118-119.

1963. *Copris (s. str.) corpulentus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 363-364.

Diagnostic characters : Elongate-oval, moderately convex, covered with reddish bristles beneath. Clypeal margin notched in middle, feebly bilobed, with a sharp pointed, backwardly curved cephalic horn in middle. Prothorax has a median groove, front angles obtuse. In male, prothoracic prominences simple, conical but flattened, dilated in female.

Distribution : India : Gujarat (Kuchchh, Junagarh), Arunachal Pradesh, Assam, Meghalaya, Rajasthan and Uttar Pradesh.

Elsewhere : Laos, Myanmar and Tonkin.

12. *Copris numa* Lansberge

1986. *Copris numa* Lansberge, *Tizds. Ent.*, 29 : 19.

1931. *Copris numa*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 121-122, pl. X, fig. 14.

1963. *Copris numa*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 364-365.

Diagnostic characters : Narrowly oval, moderately convex, covered with reddish bristles beneath. Clypeal margin feebly excised in middle, has a very short conical cephalic process just in front of eyes. Median prothoracic groove extended from base to in front of middle, front angles truncate and hind angles obsolete. Middle and hind tibia trilobed at extremity. Front tibial spurs blunt, slightly spatulate in male and pointed in female.

Distribution : India : Gujarat (Ahemdabad, Banaskantha, Patan, Porbandar, Surendranagar), Arunachal Pradesh, Assam, Rajasthan and Uttar Pradesh.

Elsewhere : Borneo, Malaya Peninsula, Myanmar, Sumatra and Tenassrim.

13. *Copris cribratus* Gillet*

1927. *Copris cribratus* Gillet, *Ann. Soc. Ent. Belg.*, 67 : 253.

1931. *Copris cribratus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 129.

1963. *Copris cribratus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 373-374.

Diagnostic characters : Chocolate brown, more reddish beneath, bristles only present on legs and punctures with pale minute setae. Clypeal margin strongly bidented in middle. Front angle of prothorax broadly rounded, prominent and hind angles almost obsolete. Front tibia broad, armed with four sharp external teeth.

Distribution : India : Gujarat (Banaskantha, Surendranagar), Arunachal Pradesh, Kerala, Meghalaya, Rajasthan and Uttar Pradesh.

14. *Copris furciceps* Felsche*

1910. *Copris furciceps* Felsche, *Deutsche. Ent. Zeitscher*, p. 348.

1931. *Copris furciceps*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 130-131.

1963. *Copris (Paracopris) furciceps*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 372.

Diagnostic characters : oval, not very convex. Head very smooth, shining in front, strongly closely punctured behind. Prothorax densely punctured, front angles blunt and hind angles obsolete. Elytra lightly striate, closely punctured. Metasternal shield well punctured except in middle line of anterior part. Front tibia armed with four sharp external teeth.

Distribution : India : Gujarat (Banaskantha, Kuchchh, Patan, Surendranagar), Arunachal Pradesh, Meghalaya, Rajasthan and Uttar Pradesh.

Elsewhere : Myanmar.

6. Genus *Phalops* Erichson 1848

The four species of the genus *Phalops* have been found from Thar Desert of Gujarat.

Key to the Species of Genus *Phalops*

1. Prothorax very shining, punctured behind *candezei* Lansberge*
- Prothorax not very shining, not punctured 2

2. Prothorax entirely granulate *divisus* (Wiedemann)*
 — Prothorax closely granulate, front angles little produced 3
3. Front angles of prothorax bluntly hooked, elytra very opaque, speckled
 *cyansecens* (D'Orbigny)
 — Prothorax rugose, granulate at the sides only and front angles blunt.....
 *olivaceus* Lansberge

15. *Phalops candezei* Lansberge*

1883. *Phalops candezei* Lansberge, *Stett. Ent. Zeit.*, 64 : 165.
 1931. *Phalops candezei*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 135.
 1963. *Phalops candezei*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 608. Pl. XIV, Fig. 221.

Diagnostic characters : Short, broad, not very convex, deep metallic green or dark blue, shining above and only scantily clothed with minute yellow setae. Clypeus transversely rugose, separated from frons by a sharp carina, sides of head produced outwards into very broadly rounded lobes. Prothorax granulated in front, unevenly punctured in middle. Front angles very bluntly produced, minutely hooked externally and hind angles minutely indicated. Elytra lightly striate, intervals rather rugosely punctured. In male, Clypeus produced as a reflexed tongue-like lobe in front but bilobed in female.

Distribution : India : Gujarat (Rajkot), Karnataka, Madhay Pradesh and Maharashtra.

16. *Phalops divisus* (Weidemann)*

1823. *Copris divisus* Weidemann, *Zool. Mag.*, 2(1) : 12.
 1931. *Phalops divisus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 135-136, Pl. I, Fig. 2.
 1963. *Phalops divisus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 1 : 609-610.

Diagnostic characters : Short, broad, not very convex. Bright metallic green, dark blue or coppery, elytra with yellow markings, dorsal surface clothed with fine erect yellow setae. Clypeus separated from frons by a carina. Front angles of prothorax broadly truncate, having minute external tooth and hind angles feebly indicated.

Distribution : India : Gujarat (Rajkot), Madhya Pradesh, Rajasthan, Tamil Nadu and Uttar Pradesh.

17. *Phalops cyanescens* (D'Orbigny)

1883. *Onthophagus olivaceus* D'Orbigny, *Ann. Soc. Ent.*, France, **64** : 243.

1931. *Phalops olivaceus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 136-137.

1963. *Phalops olivaceus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **1** : 609.

Diagnostic characters : Dark blue, elytra with a yellow outer marginal line, with numerous irregular spots. Upper surface clothed with minute yellow setae. In male, Clypeus reflexed into a tongue like process in front but bilobed in female.

Distribution : India : Gujarat (Junagarh), Rajasthan and Tamil Nadu.

18. *Phalops olivaceus* Lansberge

1883. *Phalops olivaceus* Lansberge, *Stett. Ent. Zeit.*, **44** : 164-169.

1931. *Phalops olivaceus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 137-138.

1963. *Phalops olivaceus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **1** : 610-611, Pl. XVI, Fig. 4.

Diagnostic characters : Deep bluish or greenish black, upper surface uniformly clothed with fine yellowish hairs. Clypeus separated from frons by a curved carina. Front angles of prothorax blunt, lateral margins sinuated behind. In male, prothorax little hollowed behind posterior cephalic process.

Distribution : India : Gujarat (Jamnagar) and Rajasthan.

7. Genus *Caccobius* Thomson 1863

The ten species of the genus *Caccobius* Thomson have been recorded from Thar Desert of Gujarat.

Key to Species of Genus *Caccobius*

1. Clypeus pointed, setae long above *diminutivus* (Walker)*
- Clypeus more or less bilobed or notched 2
2. Clypeus strongly bilobed *torticornis* Arrow*
- Clypeus not strongly bilobed 3
3. Metasternum well punctured and male with horn *inermis* Arrow*
- Metasternum punctured in the middle and elytra not shining 5

5. Elytra brown and vertex with a pair of horns *meridionalis* Boucomont*
 — Metasternum grooved in the middle 6
6. Elytra with orange epical patch and prothoracic lamina present in male
 *vulcanus* (Fabricius) *
 — Elytra without orange epical patch 7
7. Prothoracic carina and cephalic horns absent *indicus* Harold
 — Prothorax and elytra minutely granular 8
8. Clypeus little produced and elytra spotted *pantherinus* Arrow*
 — Clypeus shining, strongly punctured and with pale apical margin
 *denticollis* Harold*

19. *Caccobius diminutivus* (Walker)*

1858. *Copris diminutivus* Walker, *Ann. Mag. Nat. Hist.*, 2 (3) : 208.

1931. *Caccobius diminutivus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 143-144.

1963. *Caccobius (Caccophilus) diminutivus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 141-142.

Diagnostic characters : Black, shining, legs and antennae reddish, upper surface clothed with erect, sparse but regular, not very short pale setae. Head not wide nor long, having only a few scattered punctures. Clypeus bluntly pointed in front, with nearly straight sides. Prothorax coarsely, fairly closely punctured, front angles fairly sharp. Elytra straight, intervals flat, with sparingly strongly punctures. Metasternum strongly, closely punctured at sides, sparsely in middle, with large and fine intermixed punctures. Male has a pair of short, nearly straight, parallel cephalic horns at hind margin, but slight prominences in female.

Distribution : India : Gujarat (Rajkot), Maharashtra and West Bengal.

20. *Caccobius torticornis* Arrow*

1931. *Caccobius torticornis* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 144-145.

1963. *Caccobius torticornis*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 135-136.

Diagnostic characters : Black, shining with deep red spot on each shoulder, red marginal patch at extremity. Head broad, bluntly angular in front of eyes, clypeus sharply bidentate, lateral sides straight, convergent. Prothorax moderately strongly punctured, front angles sharp,

sides straight in front and feebly curved behind. Elytral intervals flat, minutely sparsely aciculate-punctate. In male, posterior margin of head produced as flat plate, its angles produced short sharp horns.

Distribution : India : Gujarat (Porbandar), Rajasthan and Uttrakhand.

21. *Caccobius inermis* Arrow*

1931. *Caccobius inermis* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 147.

1963. *Caccobius inermis*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia) 2 : 146-147.

Diagnostic characters : Small, oval, very convex. Clypeus bilobed, separated from frons by a curved carina. Prothorax with well marked posterior longitudinal groove, front angles blunt and base rounded. Terminal tooth of front tibia very blunt, set obliquely in male and long sharp in female.

Distribution : India : Gujarat (Ahemdabad, Mahesana), Arunachal Pradesh, Sikkim, Uttrakhand, Uttar Pradesh and West Bengal.

Elsewhere : Sri Lanka.

22. *Caccobius meridionalis* Boucomont*

1914. *Caccobius meridionalis* Boucomont, *Ann. Mus. Civ. Geneva*, 47 : 239.

1931. *Caccobius meridionalis*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 148-150, fig. 10.

1963. *Caccobius (Caccophilus meridi) meridionalis*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 138.

Diagnostic characters : Small, oval, very convex. Clypeus bilobed, separated from frons by a curved carina. Prothorax with well marked posterior longitudinal groove, front angles rather blunt and base rounded. Front tibial terminal tooth very blunt, set obliquely in male and long sharp in female.

Distribution : India : Gujarat (Junagarh), Karnataka, Kerala, Maharashtra, Rajasthan and Tamil Nadu.

Elsewhere : Sri Lanka.

23. *Caccobius vulcans* (Fabricius)*

1801. *Copris vulcanus* Fabricius, *Syst. Eleut.*, 1 : 41.

1931. *Caccobius vulcanus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 151-152, fig. 11.

1963. *Caccobius (Caccophilus) vulcanus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 137.

Diagnostic characters : Oval, compact, convex with short broad head. Clypeus bilobed, separated from frons by a curved carina. Prothorax strongly closely punctured, sides granulated. Front angles sharp and hind angles obsolete, base rounded. Elytra striate, intervals flat, asperately punctured in double series. Metasternum strongly grooved, bearing scattered punctures. Vertex of male has a broad, erect lamina, produced into a pair of short flat horns.

Distribution : India : Gujarat (Banaskantha, Mahesana, Porbandar, Rajkot), Bihar, Karnataka, Maharashtra and Rajasthan.

Elsewhere : Sri Lanka.

24. *Caccobius indicus* Harold

1867. *Caccobius indicus* Harold, *Col. Hefte*, 2 : 12.

1931. *Caccobius indicus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 152-153.

1963. *Caccobius (Caccophilus) indicus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 137-138.

Diagnostic characters : Broadly oval, convex. Head short and broad, clypeus bilobed, separated from frons by a strong carina. Prothorax has a slight transverse prominence in middle, front angles sharp and hind angles obsolete. In male, front tibial terminal tooth blunt, bent obliquely and sharp in female.

Distribution : India : Gujarat (Junagarh), Rajasthan, Bihar, Karnataka, Maharashtra and Rajasthan.

Elsewhere : Sri Lanka.

25. *Caccobius pantherinus* Arrow*

1931. *Caccobius pantherinus* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 154-155.

1963. *Caccobius pantherinus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 126-127.

Diagnostic characters : Oval, moderately convex, without hairs or setae upon dorsal surface. Head strongly rounded at sides, clypeus a little produced. Prothorax strongly nor

closely punctured, front angles sharp and hind angles obsolete. Elytra striate, intervals flat, distinctly not very finely punctured. Metasternal shield strongly punctured. Vertex of male produced as a broad triangular lamina, forms a short upwardly directed horns and female has a carina between eyes.

Distribution : India : Gujarat (Banaskantha, Mahesana, Porbander) and Rajasthan.

Elsewhere : Pakistan.

26. *Caccobius denticollis* Harold*

1867. *Caccobius denticollis* Harold, *Col. Hefte*, 2 : 12.

1931. *Caccobius denticollis*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 155-157, Fig. 13.

1963. *Caccobius denticollis*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 137-138.

Diagnostic characters : Very short, broad, compact Head and prothorax more or less coppery or metallic, hind margin of elytra yellow. Prothorax punctured, becoming stronger and closer at sides. Front angles sharp, intervals not closely punctured. In male, anterior cephalic carina short produced at each end into a short but slendered vertical horn while cephalic carina long and prothoracic carina has two slight lateral tubercle in female.

Distribution : India : Gujarat (Junagarh), Himachal Pradesh, Jammu and Kashmir, Rajasthan, Uttarakhand and Uttar Pradesh.

8. Genus *Onthophagus* Latreille 1802

The twenty two species of the genus *Onthophagus* have been recorded from Thar Desert of Gujarat.

Key to the species of Genus *Onthophagus*

1. Prothorax moderately closely punctured and clothed above with short inconspicuous setae *ochreatus* D'Orbigny*
- Prothorax not moderately closely punctured 2
2. Prothorax bearing only a few irregularly scattered punctures *oculatus* Arrow
- Body clothed with very dense piles 3
3. Clypeal margin strongly reflexed *dyanastoides* Arrow*
- Prothorax with evenly distributed granules 4

4. Upper surface variegated and prothorax not distinctly punctured
 *variegatus* (Fabricius)*
- Elytra very short 5
5. Prothorax black spotted and sides rounded *fuscopunctatus* (Fabricius)*
- Prothorax not asperately punctured 6
6. Prothorax strongly deeply rather closely punctured *orientalis* Harold*
- Prothorax not strongly deeply rather closely punctured 7
7. Elytra granular *productus* Arrow
- Upper surface smooth or with very fine hairy clothing, elytra more or less opaque
 8
8. Front angles of prothorax not very sharp and bears spars granules medianly and fine
 scattered punctures behind *catta* (Fabricius)
- Front angles very sharp 9
9. Frons bears a short acute horn in the middle and vertex with a pair of horns
 *bonasus* (Fabricius)*
- Prothorax not bears granules in the middle 10
10. Prothorax sparsly punctured and with blunt front angles *seniculus* (Fabricius)
- Prothorax not sparsly punctured and not with blunt front angles 11
11. Each elytron with two red patches *madoqua* Arrow*
- Elytra without spots or patches 12
12. Elytra with flat intervals and irregularly granular or rugose
 *violaceotinctus* Gillet*
- Upper surface without hairs or setae 13
13. Prothorax not very convex, unevenly punctured *rana* Arrow
- Elytra shining 14
14. Eyes very small above *kuluensis* Bates*
- Eyes not very small 15
15. Eyes larger from above. Pygidium sparsely punctured *armatus* Blanchard*
- Prothorax unequal and unevenly punctured 16

16. Entirely black, elytral intervals sparsely granulated *semicinctus* D'Orbigny*
 Elytra deeply striate, prothorax not unequally punctured 17
17. Very short and metallic *triceratops* Arrow*
 — Elytra yellow, intervals not minutely sparsely punctured 18
18. Elytral stria very finely punctured, intervals very smooth with scarcely perceptible puncturation *politus* (Fabricius)
 — Dorsally and ventrally covered with hairs, pygidium with basal ridge 19
19. Uniformly dark above, frontal margin of head rounded *ensifer* Boucomont*
 — Not uniformly dark above 20
20. Elytral intervals bearing minute granules *frugivorus* Arrow*
 — Prothorax with or without a broad anterior prominence 21
26. Prothorax rather less closely punctured, clypeus not pointed in male
 *cervus* (Fabricius)
 — Clypeus pointed, prothorax rather more closely punctured, and male with two horns
 *falsus* Gillet

27. *Onthophagus ochreatus* D'Orbigny*

1897. *Onthophagus ochreatus* D'Orbigny, *Ann. Soc. Ent. France*, **64** : 241.

1931. *Onthophagus ochreatu*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 167-168.

1963. *Onthophagus ochreatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 459.

Diagnostic characters : Broadly oval, compact, not very convex. Head large with large eyes. Clypeus a little produced, rather roughly but sparsely granulated, separated from frons by a curved carina. Prothorax moderately closely punctured, front angles sharp, sides nearly straight in front, sinuate behind. Elytra striate, 7th stria gently curved, intervals almost flat and punctured. Metsternum has small scattered punctures. Male has a pair of short, stout, parallel cephalic horns between eyes and carina in female.

Distribution : India : Gujarat (Junagarh).

Elsewhere : Arabia, Morocco, Nubia, Pakistan, Senegal and Sri Lanka.

28. *Onthophagus oculatus* Arrow

1931. *Onthophagus oculatus* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 168-169, fig. 14.
1963. *Onthophagus (Microntophagus) oculatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 460.

Diagnostic characters : Oval, not very convex. Head very large, clypeus little produced excised at front margin, separated from frons by a straight carina. Front angles of prothorax sharp. Vertex of male has a blunt prominence on each side between eyes and straight carina in female.

Distribution : India : Gujarat (Surendranagar), Kerala, Pondicherry, Rajasthan and Tamil Nadu.

Elsewhere : Sri Lanka.

29. *Onthophagus dynastoides* Arrow*

1931. *Onthophagus dynastoides* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 182-183, fig. 18.
1963. *Onthophagus (s.str.) dynastoides*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 339.

Diagnostic characters : Black or greenish black, oval rather elongate, moderately convex. Head not broad, sides rounded in front of eyes, clypeus evenly rounded, strongly reflexed in front. Prothorax very minutely, densely confluent punctured, front angles very blunt, sides obtusely angulate before middle, lightly sinuate behind. Elytra striate, with flat intervals. Metasternum moderately punctured. Clypeus of male having a broad transverse flattened erect horn at end, prothorax vertical produced obliquely forward and upward in middle as a short blunt process.

Distribution : India : Gujarat (Banaskantha), North India and Rajasthan.

Elsewhere : Sri Lanka.

30. *Onthophagus variegatus* (Fabricius)*

1798. *Copris variegatus* Fabricius, *Ent. Syst. Suppl.*, 36p.
1931. *Onthophagus vriegatus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 204-205, fig. 20.
1963. *Onthophagus (s. str.) vriegatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 362.

Diagnostic characters : Oval, highly convex. Clypeus a little produced, notched in middle. Prothorax has rather evenly, not very closely distributed fine granules. Elytra strongly punctured, with slightly convex intervals. Vertex of male has a pair of straight parallel horns, obliquely produced backwards, unite by a basal lamina.

Distribution : India : Gujarat (Kuchchh), Arunachal Pradesh, Punjab, Rajasthan and Tamil Nadu.

Elsewhere : Arabia, Abyssia, Angola, Egypt, East Africa, Pakistan, Purtgal, Somalia, Senegal, Sudan and Tanganyika.

31. *Onthophagus fuscopunctatus* (Fabricius)*

1798. *Copris fuscopunctatus* Fabricius, *Ent. Syst. Suppl.*, 36p.

1931. *Onthophagus fuscopunctatus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 206-207, fig. 21.

1963. *Onthophagus fuscopunctatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 362.

Diagnostic characters : Minute, oval, compact, very convex. Head not very broad, bidentate in front. Prothorax punctate-granular, decorated with variable black spots, front angles acute, sides straight in front and behind. Elytra deeply striate, 7th stria feebly curved punctured, intervals convex, distinctly but sparingly punctured in double rows. Metasternum has a deep median groove.

Distribution : India : Gujarat (Banskantha), Rajasthan and Tamil Nadu.

Elsewhere : Sri Lanka.

32. *Onthophagus orientalis* Harold*

1798. *Onthophagus orientalis* Harold, *Col. Hefte*, 4 : 83.

1931. *Onthophagus orientalis*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 213-214.

1963. *Onthophagus (s.str.) orientalis*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 463-464.

Diagnostic characters : Oval, convex. Clypeal margin strongly rounded. Prothorax convex, deeply closely punctured except near front margin, with deep longitudinal median groove. Elytra striate, has a little rounded irregular intervals. Pygidium strongly closely punctured, clothed with moderately long recumbent hairs. Male has a pair of backwardly, upward curving parallel horns behind eyes.

Distribution : India : Gujarat (Banaskantha), Arunachal Pradesh, Andman and Nicobar Island, Assam, Bihar, Manipur, Meghalaya, Rajasthan, Sikkim, Uttrakhand and Uttar Pradesh.

Elsewhere : Bangladesh, Malay Peninsula, Siam and South China.

33. *Onthophagus productus* Arrow

1907. *Onthophagus productus* Arrow, *Ann. Mag. Nat. Hist.*, **19** (7) : 4 23.

1931. *Onthophagus productus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 228-229, Pl. XII, figs. 9, 10.

1963. *Onthophagus (s.str.) productus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 484, Pl. XIII, fig. 8.

Diagnostic characters : Oval, very convex, lower surface clothed with thin hairy setae. Clypeus little produced in front. Front angles of prothorax blunt and hind angles well marked, base strongly rounded. Elytra striate, 7th stria strongly curved. Male has a pair of curved, backwardly sloping cephalic horns, united at base by a curved carina and female with a straight prothoracic carina.

Distribution : India : Gujarat (Ahmedabad, Mahesana, Rajkot, Surendranagar), Uttarakhand and West Bengal.

34. *Onthophagus catta* (Fabricius)

1787. *Scarabaeus catta* Fabricius, *Mant. Inst.*, **1** : 12.

1931. *Onthophagus catta*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 230-231.

Diagnostic characters : Broadly oval, convex, smooth moderately shining. Head semicircular, clypeus strongly reflexed anteriorly, separated from frons by a strong curved carina. Prothorax bearing granules in middle part, scattered punctures behind. Elytra striate, with flat intervals. Pygidium has an angulate basal carina and a few scattered punctures. Vertex of male has a pair of slender horns and prothorax with two-minute prominence, separated by a slight groove.

Distribution : India : Gujarat (Ahmedabad, Banaskantha, Jamnagar, Junagarh, Kuchchh, Mahesana, Porbander, Rajkot, Surendranagar), Arunachal Pradesh, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh and Tamil Nadu.

Elsewhere : Africa, Arabia, Pakistan, Cambodia, Myanmar, Madagascar and Sri Lanka.

35. *Onthophagus bonasus* (Fabricius)*

1775. *Scarabaeus bonasus* Fabricius, *Syst. Ent.*, p. 23.
1931. *Onthophagus bonasus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 231-232, Pl. XIII, Fig. 5 and 6.
1963. *Onthophagus (Digitonthophagus) bonasus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 296-297, Pl. XII, Fig. 5.

Diagnostic characters : Very broadly oval, convex. Legs, sides clothed with yellow setae beneath. Head semi-circular with strongly reflexed front margin, with a short acute horn in middle, vertex with a pair of back wardly directed horns. Prothorax has a slight median groove, front angles acutely produced, sides feebly sinuate, hind angles and base angulate in middle. Front tibia of male elongate and slender, having feebly curved external teeth and inner extremity produced as a long slender tooth.

Distribution : India : Gujarat (Banaskantha, Kuchchh), Arunachal Pradesh, Himachal Pradesh, Haryana, Karnataka, Maharashtra, Madhya Pradesh, Punjab, Rajasthan and Tamil Nadu, Uttar Pradesh.

Elsewhere : Afghanistan, Pakistan, Myanmar, Siam, Tonkin and Cambodia.

36. *Onthophagus seniculus* (Fabricius)

1781. *Scarabaeus seniculus* Fabricius, *Spec. Ins.*, 1 : 23.
1931. *Onthophagus seniculus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 235-236.

Diagnostic characters : Broadly oval, moderately compact, smooth, not very shining above. Head having a straight, parallel carina, basal joint of antenna has serrate anterior edge. Prothorax has smooth, shining excavation just behind front margin and horizontal prominence behind each excavation. Clypeus of male curved upward a little in front, sides nearly straight but semicircular in female and dorsal prothoracic prominence is slightly rounded.

Distribution : India : Gujarat (Ahemdabad, Banskantha, Jamnagar, Junagarh, Kuchchh, Mahesana, Patan, Porbander, Rajkot, Surendranagar), Arunachal Pradesh, Rajasthan and Uttar Pradesh.

Elsewhere : Malay Peninsula, Myanmar, China and Indo-China.

37. *Onthophagus madoqua* Arrow*

1931. *Onthophagus madoqua* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 258-259.

1963. *Onthophagus (s.str.) madoqua*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 426.

Diagnostic characters : Oval, convex. Head short, broad, with feebly curved sides. Prothorax strongly closely punctured, front angles a little produced and hind angles very obtuse, lateral margins feebly sinuate. Elytra striate, intervals flat and asperate-punctuate. Metasternal shield having irregularly scattered punctured. Vertex of male has a pair of quite separate, straight erect and parallel horns and female with two short transverse prothoracic prominences just behind middle of front margin.

Distribution : India : Gujarat (Ahemdabad, Banaskantha, Mahesana, Surendanaga), Rajasthan and Tamil Nadu.

38. *Onthophagus violaceotinctus* Gillet*

1925. *Onthophagus violaceotinctus* Gillet, *Ann. Soc. sci. Broux*, 23.

1931. *Onthophagus violaceotinctus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 259.

1963. *Onthophagus (s. str.) violaceotinctus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 582-583.

Diagnostic characters : Oval, rather deeply waisted, highly convex. Head flat, densely rugosely punctured, almost imperceptibly produced in middle of front margin, with a minute tubercle in middle. Front angles of prothorax acute. Elytra striate, intervals flat, irregularly granular or rugose. Metasternal shield distinctly but unevenly punctured in middle and rather more or closely at sides. Front tibial spurs of male strongly bent and acutely pointed.

Distribution : India : Gujarat (Banaskantha), Andhra Pradesh and Tamil Nadu.

39. *Onthophagus rana* Arrow

1931. *Onthophagus rana* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 268-269, fig. 231.

1963. *Onthophagus (s.str.) rana*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 498.

Diagnostic characters : Elongate-oval, compact, not very convex. Head broad, with straight front margin in middle, clypeus separated from frons by a short straight carina. Front angles of prothorax blunt, lateral sides gently curved in front, straight behind, base rounded. Metasternal shield is smooth. In male has a slight declivity in front of prothorax.

Distribution : India : Gujarat (Junagarh) and Tamil Nadu.

40. *Onthophagus kuluensis* Bates*

1891. *Onthophagus kuluensis* Bates, *Entom. Suppl.*, 34 : 12.
 1931. *Onthophagus kuluensis*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 292-293.
 1963. *Onthophagus kuluensis*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 409-410.

Diagnostic characters : Oval, moderately convex. Head broad, clypeus nearly straight in front, separated from frons by a straight carina. Front angles of prothorax blunt, lateral margin feebly curved in front, base obtusely angulated in middle. Male has a pair of nearly parallel horns, connected by a ridge and female with straight carina on vertex.

Distribution : India : Gujarat (Junagarh), Arunachal Pradesh, Haryana, Himachal Pradesh, Jammu and Kashmir, Rajasthan, Uttarakhand and Uttar Pradesh.

41. *Onthophagus armatus* Blanchard*

1853. *Onthophagus armatus* Blanchard, *Voy. Au. Pole. Sud.*, p. 98, Pl. VII, figs. 9 and 10.
 1931. *Onthophagus armatus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 293-294.
 1963. *Onthophagus (s. str.) armatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 277-278.

Diagnostic characters : Broadly oval, compact, moderately convex. Head large and broad, clypeal margin straight, feebly excised in middle. Prothorax not closely punctured, front angles blunt, lateral margin nearly straight in front and very feebly sinuate behind. Elytra deeply striate, intervals convex, very minutely sparsely punctured. Vertex of male has a smooth broad lamina with upwardly curved a pair of short horns.

Distribution : India : Gujarat (Porbander), Arunachal Pradesh, Assam and Rajasthan.

Elsewhere : Indonesia, Myanmar, Philippine Island and Vietnam.

42. *Onthophagus semicinctus* D'Orbigny*

1897. *Onthophagus semicinctus* D'Orbigny, *Ann. Soc. Ent. France*, 64 : 242.
 1931. *Onthophagus semicinctus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 294.
 1963. *Onthophagus (s. str.) semicinctus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 518, Fig. 208.

Diagnostic characters : Oval, not very convex. Head broad with strongly rounded ocular lobes, clypeus a little produced and excised at front margin. Front angles of prothorax not

sharp, lateral margins straight in front, sinuate behind. Male has a pair of unconnected parallel cephalic horns, sloping obliquely backwards and female with slightly curved frons carina along with straight carina.

Distribution : India : Gujarat (Junagarh), Maharashtra and Rajasthan.

Elsewhere : Pakistan.

43. *Onthophagus triceratops* Arrow*

1913. *Onthophagus triceratops* Arrow, *Rec. Ind. Mus.*, 8 : 195.

1931. *Onthophagus triceratops*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 301-302, fig. 36.

1963. *Onthophagus (s.str.) triceratops*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 559.

Diagnostic characters : Broadly oval, moderately convex. Head broad, angularly dilated in front of eyes. Prothorax closely punctured, front angles pointed, not very sharp, sides are straight and base rounded. Elytra strongly striate, striae punctured, intervals convex. Metasternal shield smooth in middle, punctured at sides. Vertex of male produced backwards as a broad flat plate, dialting behind, bearing strongly curved horns at outer angles.

Distribution : India : Gujarat (Surendranagar), Arunachal Pradesh and Assam.

44. *Onthophagus politus* Fabricius

1798. *Copris politus* Fabricius, *Ent. Soc. Suppl.*, 35.

1931. *Onthophagus politus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 309-310, fig. 39.

1963. *Onthophagus (s.str.) politus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 480-481.

Diagnostic characters : Minute, broadly oval, compact, convex. Clypeus feebly bluntly bilobed in front, with a few punctures on each side. Prothorax bearing a fine scattered punctures. Front and hind angles obtuse, sides gently rounded in front and feebly sinuate behind, base strongly rounded. Elytra strongly striate, striae minutely sparingly punctured, 7th stria gently curved, intervals very smooth, shining.

Distribution : India : Gujarat (Patan), Arunachal Pradesh, Bihar, Karnataka, Rajasthan and Tamil Nadu.

Elsewhere : Sri Lanka.

45. *Onthophagus ensifer* Boucomont*

1914. *Onthophagus ensifer* Boucomont, *Ann. Mus. Civ. Genova*, **46** : 220.
 1931. *Onthophagus ensifer*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 334-335, fig. 41.
 1963. *Onthophagus* (s. str.) *ensifer*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 342.

Diagnostic characters : Oval, moderately convex. Head not very broad, clypeus and ocular lobes rounded. Front angles of prothorax a little produced, fairly sharp, lateral margins straight in front and sinuate behind. Male has very long slendered, slightly flattened, backwardly directed curved cephalic horn, arises from middle of frons, extending upto middle of body and female has curved cephalic carina.

Distribution : India : Gujarat (Mahesana, Surendranagar), Andhra Pradesh, Arunachal Pradesh, Kerala, Rajasthan and Uttar Pradesh.

46. *Onthophagus frugivorus* Arrow*

1931. *Onthophagus frugivorus* Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 336-337.
 1963. *Onthophagus* (*Paraphanaeomorphus*) *frugivorus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 356.

Diagnostic characters : Black or very dark chocolate brown, oval and highly convex rather deeply waisted. Head not very broad, closely moderately punctured, clypeal margin strongly evenly rounded and ocular lobes are prominent and rounded. Prothorax strongly evenly punctured. Front angles prominent, lateral margins straight in front and sinuate behind, base strongly rounded. Elytra shallowly striate, intervals flat, bearing scattered punctures. Frons of male has a long backwardly directed slender horn, arising between eyes.

Distribution : India : Gujarat (Banaskantha, Porbander), Assam, Rajasthan and Uttar Pradesh.

47. *Onthophagus cervus* Fabricius

1798. *Copris cervus* Fabricius, *Ent. Syst. Suppl.*, 31 p.
 1931. *Onthophagus cervus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 336-337.

Diagnostic characters : Oval, moderately convex. Head not very broad, clypeus a little produced, vertex having a pair of backwardly sloping horns, broad at base but not united. Prothorax fairly, strongly, not very closely but evenly punctured and with intermixed small

punctures. Front angles rather sharp, lateral margin straight in front and sinuate behind. Elytra striate, intervals slightly convex and punctured. Pygidium punctured, with intermix large and small punctures.

Distribution : India : Gujarat (Banaskantha, Porbander), Andaman and Nicobar Island, Arunachal Pradesh, Karnataka, Kerala, Madhaya Pradesh, Maharashtra, Pondicherry, Rajasthan, Uttarakhand and West Bengal.

Elsewhere : Sri Lanka.

48. *Onthophagus falsus* Gillet

1925. *Onthophagus falsus* Gillet, *Ent. Syst. Suppl.*, 36p.

1931. *Onthophagus falsus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 350-352, fig. 46.

1963. *Onthophagus (s. str.) falsus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 345-346.

Diagnostic characters : Broadly oval and moderately convex. Head not very broad, clypeus a little produced. Front angles rather sharply produce, lateral margins nearly straight in front and sinuate behind, base rounded. Vertex of male with a pair of cephalic horns, very broad and backwardly directed at base.

Distribution : India : Gujarat (Jamnagar), Haryana, Himachal Pradesh, Jammu and kashmir, Meghalaya and Rajasthan. **Elsewhere**: Bangladesh and Pakistan.

9. Genus *Oniticellus* Serville 1825

The four species of the genus *Oniticellus* have been found from Thar Desert of Gujarat.

Key to the species of the genus *Oniticellus*

1. Head with carina and prothorax sparingly punctured *pallipes* (Fabricius)*
- Prothorax not sparingly punctured 2
2. Prothorax closely punctured..... *pallens* (Oliver)
- Head without carina 3
3. Dorsal surface opaque *spinipes* Roth*
- Dorsal surface very smooth and shining *cinctus* (Fabricius)

49. *Oniticellus pallipes* (Fabricius)*

1781. *Scarabaeus pallipes* Fabricius, *Spec. Ins.*, 1 : 33.

1931. *Oniticellus pallipes*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 375-376, Fig. 52.

1963. *Oniticellus (Euoniticellus) pallipes*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 74, Pl. X. Fig. 3.

Diagnostic characters : Narrowly elongate. Head short and broad, clypeal margin straight in front, vertex hollowed. Prothorax has slight posterior median groove and having an spot a little behind of front margin in middle, a similar one on each side of last, one on each side of middle and another one in same line near outer margin, a pair near middle of base and one on middle of pygidium. Front angles rectangular, sides strongly rounded, base angulate in middle.

Distribution : India : Gujarat (Banaskantha, Jamnagar, Patan, Porbander), Haryana, Himachal Pradesh, Jammu and Kashmir, Maharashtra, Rajasthan, Tamil Nadu and West Bengal.

Elsewhere : Bangladesh.

50. *Oniticellus pallens* (Olivier)

1789. *Scarabaeus pallens* Olivier, *Ent.*, 3(1) : 170, Pl. 33, fig. 203.

1931. *Oniticellus pallens*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 377-378.

1963. *Oniticellus (Euoniticellus) pallens*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 75.

Diagnostic characters : Rather narrowly elongate. Head short and broad, clypeus straight in front, vertex hollowed. Front angles of prothorax rectangular, lateral margins strongly bent in middle, base obtusely angulate in middle and dorsal surface having a triangular spot on each side of middle, a pair of spots near middle of base. Front tibia of male broad, armed with four but not very stout external teeth and stout in femal.

Distribution : India : Gujarat (Kuchchh), Haryana, Himachal Pradesh, Uttar Pradesh and Rajasthan.

Elsewhere : Arabia, Algeria, Egypt, Pakistan and Somalia.

51. *Oniticellus spinipes* Roth*

1851 *Oniticellus spinipes* Roth, *Arch. F. Nat.*, 1 : 128.

1931. *Oniticellus spinipes*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 378-379.

Diagnostic characters : Elongate oval, very flat. Head without carina and clypeus feebly emmarginate in middle. Prothorax densely subrugosely punctured, with a longitudinal median line upon basal half. Front angles blunt and hind angles obsolete, sides rounded anteriorly and straight behind. Elytra striate, intervals flat, minutely granulated. Pygidium setose. Metasternum opaque, sparsely granulated. Clypeus short, rounded, slightly produced in male and excised in female.

Distribution : India : Gujarat (Junagarh), Haryana, Himachal Pradesh, Karnataka and Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Uttarakhand and Uttar Pradesh.

Elsewhere : Abyssinia, East and West Africa, Rodentia, Transval and Uganda.

52. *Oniticellus cinctus* (Fabricius)

1775. *Scarabaeus cinctus* Fabricius, *Syst. Ent.*, 30.

1931. *Oniticellus cinctus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 379-380.

1963. *Oniticellus* (s. str.) *cinctus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 77.

Diagnostic characters : Oblong-oval, not very convex. Head without carina or elevations, clypeus short, with a slight depression just behind middle of front margin, rounded and gently excised in middle. Prothorax very smooth, with deeply impressed median longitudinal line, sides straight in front and rounded behind. Front angles rounded and hind angles almost obsolete. Elytra deeply striate, striae closely punctured, intervals convex, very minutely sparingly punctured. Front tibia of male produced at extremity into a broad, blunt and slightly hooked processes but external teeth longer, stouter and terminal one distinctly oblique.

Distribution : India : Gujarat (Junagarh, Patan), Arunachal Pradesh, Assam, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Annam, Bangladesh, Malaya Peninsula, Myanmar, Siam and South China.

10. Genus *Drepanocerus* Kirby, 1828

The three species of the genus *Drepanocerus* have been found from the Thar Desert of Gujarat.

Key to the Species of Genus *Drepanocerus*

1. Front angles of prothorax indistinct; head coarsely and closely punctured and male with two thoracic horns *sinicus* Harold*

- Head finely, fairly, closely punctured and male without horns 2
2. Prothorax with six longitudinal ridges at base *runicus* Arrow*
- Prosternum elevated behind front coxae, continuous with metasternum
 *exsul* (Sharp)

53. *Drepanocerus sinicus* Harold*

1868. *Drepanocerus sinicus* Harold, Col. Hefte, 4 : 104.

1931. *Drepanocerus sinicus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 383-384, fig. 54.

1963. *Drepanocerus sinicus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 67-68, fig. 39.

Diagnostic characters : Elongate-oval, depressed. Head densely sculptured opaque, excavated upon clypeus. Clypeus strongly punctured, shining and bidentate. Prothorax covered with large shallow pits, sides straight in front and sinuate behind. Front angles extremely blunt and hind angles almost obsolete, base obtusely angulate in middle. Elytra opaque, broadly but shallowly striate, with a straight setose ridge upon anterior half of 3rd interval, an entire bisinuate ridge upon the 5th interval and one upon interrupted behind shoulder.

Distribution : India : Gujarat (Junagarh, Rajkot) and Uttarakhand.

Elsewhere : Myanmar.

54. *Drepanocerus runicus* Arrow*

1909. *Drepanocerus runicus* Arrow, *Ann. Mag. Nat. Hist.*, 8(4) : 93.

1931. *Drepanocerus runicus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 384-385.

1963. *Drepanocerus runicus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 66-67, fig. 38.

Diagnostic characters : Elongate-oval, depressed. Head closely punctured, with bidentate clypeus and vertex bearing three short longitudinal carinae. Prothorax coarsely closely punctured, deeply widely transversely excavated just before middle, with two curved longitudinal carinae on outer side. Elytra widely but very shallowly striate, with large indistinct punctures in striae and very flat intervals.

Distribution : India : Gujarat (Junagarh).

Elsewhere : Myanmar and Tonkin.

55. *Drepanocerus exsul* (Sharp)

1875. *Oniticellus exsul* Sharp, *Col. Hefte*, 13 : 53.

1931. *Drepanocerus exsul*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 385-386, Fig. 55.

Diagnostic characters : Elongate, sub-rectangular, very flat above. Head flat, broad, sides bidentate. Prothorax has slightly broad elevation in front, with transverse depression in middle. Lateral margins converging towards base, strongly rounded in front, nearly straight behind, base obtusely angular in middle. Elytra striate, outer stria and sides sinuous, sternites abruptly reflected, bearing three prominences on sutural intervals and stiff bristles. Middle and hind tibiae slendered, bearing minute bristles at their outer edge and three very blunt teeth.

Distribution : India : Gujarat (Junagarh, Patan, Porbander, Rajkot, Surendranagar), Arunachal Pradesh, Assam, Meghalaya and Rajasthan.

Elsewhere : Siam.

11. Genus *Onitis* Fabricius

The author recorded four species of the genus *Onitus* from Thar Desert of Gujarat.

Key to the Species of Genus *Onitis*

1. Clypeus without a carina, clypeo-frontal carina simple and entire *siva* Gillet*
- Clypeus with a carina 2
2. Prothorax very lightly punctured *lama* Lansberge*
- Prothorax not very lightly punctured, clypeo-frontal carina not simple 3
3. Prothorax sparsely punctured, without a well marked median groove or line
..... *falcatus* (Wulfen)
- Prothorax strongly and closely punctured with well-marked median line, clypeo-frontal carina interrupted *philemon* Fabricius

56. *Onitis siva* Gillet*

1911. *Onitis siva* Gillet, *Ann. Soc. Ent. Belg.*, 4 : 313.

1931. *Onitis siva*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 388-389.

1963. *Onitis siva*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearkti-schen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 53-54.

Diagnostic characters : Elongate-oval, moderately convex. Clypeal margin strongly rounded, separated from frons by a strongly elevated curved carina. Prothorax has a trace

of a longitudinal median groove posteriorly in middle, uniting with close and narrow basal foveae. Front angles acutely rectangular and hind angles obsolete. Front legs of male elongate, femur having a very strong spine at middle of anterior edge. Hind femur little hollowed on lower surface and has a hooked tooth just beyond middle on anterior edge.

Distribution : India : Gujarat (Banaskantha), Arunachal Pradesh, Kerala, Rajsthan, Tamil Nadu and Uttar Pradesh.

57. *Onitis lama* Lansberge*

1875. *Onitis lama* Lansberge, *Ann. Soc. Ent. Belgium*, **18** : 123.

1931. *Onitis lama*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 389-390, Pl. XI, Fig. 11 and 12.

1963. *Onitis lama*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearkt-ischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 44-45.

Diagnostic characters : Narrowly oval, very convex. Head has a strongly elevated, slightly acute frontal carina, a short straight another transverse carina and a trisinate vertex carina extended from eye to eye. Front angles of prothorax blunt, sides strongly rounded, base completely rounded. Front femur of male having a very sharp oblique tooth beyond middle of lower edge and hind femur with a tooth near end of lower edge.

Distribution : India : Gujarat (Ahemdabad, Banaskantha, Mahesana, Patan, Rajkot), Haryana, Punjab, Rajasthan Uttarakhand and Uttar Pradesh.

58. *Onitis falcatus* (Wulfen)

1786. *Scarabaeus falcatus* Wulfen, *Descr. Cap. Ins.*, p. 14, pl. 2, fig. 17.

1931. *Onitis falcatus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), **3** : 392-393, pl. XI, figs. 9, 10.

1963. *Onitis falcatus*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), **2** : 33-34, pl. IV, fig. 1.

Diagnostic characters : Narrowly oval, convex. Clypeus elliptical, clypeo-frontal carina widely interrupted, with a short frontal tubercle behind it. Prothorax has basal foveae. Front tibia of male elongate, armed with four short external teeth, two or three minute teeth before middle of lower surface and a sharp incurved terminal process. Middle femur has a minute tooth near end of lower edge.

Distribution : India : Gujarat (Kuchchh), Arunachal Pradesh, Assam, Haryana, Karnataka, Meghalaya, Manipur, Rajasthan, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh, Malaya Peninsula, Philippine Island and South-China.

59. *Onitis philemon* Fabricius

1801. *Onitis philemon* Fabricius, *Syst. Eleut.*, 1 : 30.

1931. *Onitis philemon*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 393-394, Pl. XI, figs. 3, 4.

1963. *Onitis philemon*, Balthasar, *Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region* (Coleoptera : Lamellicornia), 2 : 41, Pl. V, fig. 2.

Diagnostic characters : Oval, not very elongate. Clypeus parabolic, has a feeble emargination in middle, a short transverse carina just before it and a conical tubercle just behind it. Front angles of prothorax rectangular and hind angles obsolete, sides straight in front, strongly rounded in middle, base obtusely angulate in middle. Middle femur of male has a sharp tooth near end of lower. Front tibia of female broad, armed with four strong external teeth and an articulated terminal spur.

Distribution : India : Gujarat (Banaskantha, Junagarh, Kuchchh, Patan, Porbander, Rajkot, Surendranagar), Arunachal Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal.

Elsewhere : Sri Lanka.

12. Genus *Chironitis* Lansberge, 1875

The single species *chironitis indicus* has been found from Thar Desert of Gujarat.

60. *Chironitis indicus* Lansberge

1875. *Chironitis indicus* Lansberge, *Ann. Soc. Ent.*, Belgium, 18 : 45.

1931. *Chironitis indicus*, Arrow, *Fauna of British India including Ceylon and Burma* (Coleoptera : Lamellicornia : Coprinae), 3 : 402-403, Pl. XII, Fig. 15 and 16.

Diagnostic characters : Oblong, depressed. Front margin of clypeus strongly depressed, with a short transverse posterior carina and clypeo-frontal carina bears short erect setae. Prothorax broader than elytra, lateral margin strongly dilated, convergent. Front angles slightly and hind angles strongly obtuse, basal foveae narrow. Front femur has a sharp strong tooth near end of anterior edge.

Distribution : India : Gujarat (Jamnagar and Rajkot), Karnataka, Maharashtra, Rajasthan and Tamil Nadu.

Elsewhere : Pakistan.

Table-I : District-wise localities surveyed in Thar Desert of Gujarat

Sl. No.	Name of District	Name of Locality	Date of Survey
1.	Ahemdabad	Viramgam to Nalsarovar road Mandal and around	13-12-2005 14-12-2005
2.	Banaskantha	Dantiwara dam and around Dhanera and around Tharad and around Deodar and around Suigam and around Bhavar and around	20-08-1992 03-12-2005 03-12-2005 04-12-2005 05-12-2005 06-12-2005
3.	Kuchchh	Mandvi and around Bhuj and around Kandla and around Loriya and around Anjar and around Rapar and around Mundra and around Nakhtarana and around Rudranimata and around Bhachhau and around	05-12-1993, 26-12-2004 05-12-1993, 06-12-1993 07-12-1993 08-12-1993, 28-12-2004 25-12-2004 26-12-2004 27-12-2004 28-12-2004 28-12-2004
4.	Jamnagar	Nikava and around Jodiya and around Khambhalia and around Dhrol and around Bhanvad and around Ranjeetbadi and around Jamnagar and around	08-03-1986 22-08-1990 27-08-1990, 31-08-2004 24-08-1990, 31-08-2004 28-08-1990 29-08-2004 30-08-2004
5.	Junagarh	Satadar and around Manvadar and around Junagarh and around Kesod and around Veraval and around Mangrol and around	01-09-1990 03-09-1990, 02-09-2004 03-09-2004 04-09-2004 04-09-2004 04-09-2004
6.	Mahesana	Becharaji and around Kadi and around	13-12-2005 15-12-2005

Sl. No.	Name of District	Name of Locality	Date of Survey
7.	Patan	Shantalpur and around	07-12-2005
		Radhanpur and around	08-12-2005
		Harij and around	08-12-2005
8.	Porbandar	Advana and around	01-09-2004
		Villa Circuit House and around	01-09-2004
		Kutiya and around	02-09-2004
9.	Rajkot	Gondal and around	06-09-1990, 05-09-2004
		Tankara and around	08-09-1990
		Sardhar and around	09-09-1990
		Dhoraji and around	05-09-2004
		Morbi and around	06-09-2004
		Bhojpura Village and around	07-09-2004
		Unchimandal and around	08-09-2004
10.	Surendranagar	Chotila and around	13-03-1986
		Halvad and around	08-09-2004
		Dharagdhra and around	10-12-2005
		Lakhtar and around	11-12-2005
		Patadi and around	12-12-2005

Table-II : Species-wise distribution of Dung Beetle in district of Thar Desert of Gujarat

Sl. No.	Name of Species	Name of District	No. of Example(S)	Date of Collection	Name of Collector
1.	<i>Gymnopleurus cyaneus</i> (Fabricius)	Jamnagar	3	05-09-2004	R. Sewak
		Rajkot	2	08-09-2004	R. Sewak
2.	<i>Gymnopleurus miliaris</i> (Fabricius)	Kuchchh	5	25-08-2004	
		Porbandar	62	01-09-2004	R. Sewak
		Jamnagar	5	23-08-1990	R. Sewak
3.	<i>Gymnopleurus gemmatus</i> Harold*	Porbandar	12	01-09-2004	R. Sewak
4.	<i>Heliocopriss gigas</i> (Linnaeus)*	Junagarh	3	02-09-2004	R. Sewak
5.	<i>Catharsius platypus</i> Sharp*	Jamnagar	3	31-08-2004	R. Sewak
		Junagarh	2	02-09-2004	R. Sewak
6.	<i>Catharsius sagax</i> Quenstedt*	Rajkot	2	02-09-2004	R. Sewak

Sl. No.	Name of Species	Name of District	No. of Example(S)	Date of Collection	Name of Collector
7.	<i>Catharsius pithecius</i> (Fabricius)*	Ahemdabad	1	13-12-2005	R. Sewak
		Kuchchh	3	26 th , 27 th and 28 th Aug., 2004	R. Sewak
		Mahesana	2	13-12-2005	R. Sewak
		Patan	5	7 th and 8 th Dec., 2005	R. Sewak
		Surendranagar	1	11-12-2005	R. Sewak
8.	<i>Copris indicus</i> Gillet	Kuchchh	13	6 th , 7 th Dec, 1993 and 26 th , 27 th August, 2004	R. Sewak R. Sewak
9.	<i>Copris repertus</i> Walker*	Banaskantha	4	3 rd and 4 th Dec. 2005	R. Sewak
		Kuchchh	5	07-12-1993	R. Sewak
		Mahesana	3	13-12-2005	R. Sewak
		Patan	2	13-12-2005	R. Sewak
		Porbandar	2	02-09-2004	R. Sewak
		Surendranagar	1	12-12-2005	R. Sewak
10.	<i>Copris delicates</i> Arrow*	Ahemdabad	1	13-12-2005	R. Sewak
11.	<i>Copris corpulentus</i> Gillet	Kuchchh	12	07-12-1993, 26 th and 7 th Aug., 2004	R. Sewak R. Sewak
		Surendranagar	5	08-09-2004, 11-12-2005	R. Sewak R. Sewak
12.	<i>Copris numa</i> Lansberge	Ahemdabad	2	14-12-2005	R. Sewak
		Banaskantha	3	03-12-2005	R. Sewak
		Kuchchh	5	07-12-1993, 27-08-2004	R. Sewak
		Porbandar	2	02-09-2004	R. Sewak
		Surendranagar	3	11-12-2005	R. Sewak
13.	<i>Copris cribratus</i> Gillet*	Banaskantha	5	03-12-2005	R. Sewak
		Surendranagar	3	08-09-2004, 11-12-2005	R. Sewak

Sl. No.	Name of Species	Name of District	No. of Example(S)	Date of Collection	Name of Collector
14.	<i>Copris furciceps</i> Felsche*	Banaskantha	1	03-12-2005	R. Sewak
		Kuchchh	4	26 th and 27 th Aug. 2004	R. Sewak
		Patan	4	7 th and 8 th Aug. 2004	R. Sewak
		Surendranagar	2	11-12-2005	R. Sewak
15.	<i>Phalops candenzei</i> Lansberge*	Junagarh	1	04-09-2004	R. Sewak
16.	<i>Phalops divisus</i> (Wiedmann)*	Rajkot	2	05-09-2004	R. Sewak
17.	<i>Phalops cyanescens</i> (D'Orbigny)	Junagarh	11	01-09-1990	R. Sewak
18.	<i>Phalops olivaceus</i> Lansberge	Jamnagar	3	22-08-1990	R. Sewak
19.	<i>Caccobius diminutivus</i> (Walker)*	Rajkot	2	5 th and 6 th Sept., 2004	R. Sewak
20.	<i>Caccobius torticornis</i> Arrow*	Porbandar	15	1-09-2004	R. Sewak
21.	<i>Caccobius inermis</i> Arrow*	Ahemdabad	1	14-12-2005	R. Sewak
		Mahesana		15-12-2005	R. Sewak
22.	<i>Caccobius meridionalis</i> Boucomont	Junagarh	2	04-09-2004	R. Sewak
23.	<i>Caccobius vulcanus</i> (Fabricius)*	Banaskantha	5	03-12-2005	R. Sewak
		Mahesana	4	15-12-2005	R. Sewak
		Porbandar	7	1 st and 2 nd Sept., 2004	R. Sewak
		Rajkot	5	08-09-2004	R. Sewak
24.	<i>Caccobius indicus</i> Harold	Junagarh	15	03-09-1990, 2 nd and 4 th Sept., 2004	R. Sewak R. Sewak
25.	<i>Caccobius pantherinus</i> Arrow*	Banaskantha	1	03-12-2005	R. Sewak
		Mahesana	2	15-12-2005	R. Sewak
		Porbandar	26	01-09-2004	R. Sewak

Sl. No.	Name of Species	Name of District	No. of Example(S)	Date of Collection	Name of Collector
26.	<i>Caccobius denticollis</i> Harold*	Junagarh	2	02-09-2004	R. Sewak
27.	<i>Onthophagus ochreatus</i> D'Orbigny*	Junagarh	4	04-09-2004	R. Sewak
28.	<i>Onthophagus oculatus</i> Arrow	Surendranagar	6	13-03-1986	R. Sewak
29.	<i>Onthophagus dynastoides</i> Arrow*	Banaskantha	3	03-12-2005	R. Sewak
30.	<i>Onthophagus variegatus</i> (Fabricius)*	Kuchchh	2	07-12-1993	R. Sewak
31.	<i>Onthophagus fusco-punctatus</i> (Fabricius)*	Banaskantha	3	03-12-2005	R. Sewak
32.	<i>Onthophagus orientalis</i> Harold*	Banaskantha	2	03-12-2005	R. Sewak
33.	<i>Onthophagus productus</i> Arrow	Ahemdabad Mahesana Rajkot Surendranagar	1 9 5 11	13-12-2005 15-12-2005 06-09-1990 14-12-2005	R. Sewak R. Sewak R. Sewak R. Sewak
34.	<i>Onthophagus catta</i> (Fabricius)	Ahemdabad Banaskantha Kuchchh Jamnagar Junagarh Mahesana	14 32 38 48 56 15	13 th and 14 th Dec., 2005 4 th and 6 th Dec., 2005 25 th to 29 th Dec., 2004 23 rd , 24 th , 26 th to 28 th Aug., 1990, 29 th to 30 th Aug., 2004 03-09-1990, 2 nd to 4 th Sept., 2004 13-12-2005 1 st and 2 nd Sept., 2004	R. Sewak R. Sewak R. Sewak R. Sewak R. Sewak R. Sewak

Sl. No.	Name of Species	Name of District	No. of Example(S)	Date of Collection	Name of Collector
	<i>Onthophagus catta</i> (Fabricius)	Porbandar	23	08-12-2005	R. Sewak
		Patan	18	6 th to 8 th Sept., 1990, 5 th to 7 th	R. Sewak
		Rajkot	24	Sept., 2004 10 th to 12 th	R. Sewak
		Surendranagar	65	Dec., 2005 14-12-2005	R. Sewak
35.	<i>Onthophagus bonasus</i> (Fabricius)*	Banaskantha	23	3 rd , 4 th , 5 th and 8 th Dec., 2005	R. Sewak
		Kuchchh	9	07-12-1992, 27-08-2004	R. Sewak
36.	<i>Onthophagus seniculus</i> (Fabricius)	Ahemdabad	15	13 th and 14 th Dec., 2005	R. Sewak
		Banaskantha	30	4 th and 6 th Dec., 2005	R. Sewak
		Kuchchh	39	25 th to 29 th Dec., 2004	R. Sewak
		Jamnagar	50	29 th to 30 th Aug., 2004	R. Sewak
		Junagarh	55	2 nd to 4 th Sept., 2004	R. Sewak
		Mahesana	16	13-12- 2005 1 st and 2 nd Sept., 2004	R. Sewak
		Porbandar	23	08-12-2005	R. Sewak
		Patan	14	5 th to 7 th Sept., 2004	R. Sewak
		Rajkot	24	10 th to 12 th Dec., 2005	R. Sewak
		Surendranagar	65	14-12-2005	R. Sewak
37.	<i>Onthophagus madoqua</i> Arrow*	Ahemdabad	6	13-12-2005	R. Sewak
		Banaskantha	35	13-12-2005	R. Sewak
		Patan	6	08-12-2005	R. Sewak

Sl. No.	Name of Species	Name of District	No. of Example(S)	Date of Collection	Name of Collector
38.	<i>Onthophagus violaceotinctus</i> Gillet*	Banaskantha	2	03-12-2005	R. Sewak
39.	<i>Onthophagus rana</i> Arrow	Junagarh	6	01-09-1990	R. Sewak
40.	<i>Onthophagus kuluensis</i> Bates*	Junagarh Porbandar	3 5	04-09-2004 04-09-2004	R. Sewak R. Sewak
41.	<i>Onthophagus armatus</i> Blanchard*	Porbandar	4	01-09-1990	R. Sewak
42.	<i>Onthophagus semicinctus</i> D'Orbigny*	Junagarh	4	30-08-1990	R. Sewak
43.	<i>Onthophagus triceratops</i> Arrow*	Surendranagar	2	10-12-2005	R. Sewak
44.	<i>Onthophagus politus</i> (Fabricius)	Junagarh	4	30-08-1990	R. Sewak
45.	<i>Onthophagus ensifer</i> Boucomont*	Mahesana Surendranagar	3 5	08-12-2005 15-12-2005	R. Sewak R. Sewak
46.	<i>Onthophagus frugivorus</i> Arrow	Banaskantha	2	06-12-2005	R. Sewak
47.	<i>Onthophagus cervus</i> (Fabricius)*	Banaskantha Jamnagar Porbandar	2 3 2	06-12-2005 03-12-2005 01-09-1990	R. Sewak R. Sewak R. Sewak
48.	<i>Onthophagus falsus</i> Gillet	Jamnagar	2	27-08-1990	R. Sewak
49.	<i>Oniticellus pallipes</i> (Fabricius)*	Banaskantha Jamnagar Patan Porbandar	6 12 6 45	03-12-2005 31-08-2004 08-12-2005 01-09-2004	R. Sewak R. Sewak R. Sewak R. Sewak
50.	<i>Oniticellus pallens</i> (Olivier)	Kuchchh	12	06-12-1993 and 07-12-1993	R. Sewak
51.	<i>Oniticellus spinipes</i> Roth*	Kuchchh	2	27-08-2004	R. Sewak
52.	<i>Oniticellus cinctus</i> (Fabricius)	Junagarh Patan	12 2	01-09-1990, 04-09-2004 08-12-2005	R. Sewak R. Sewak R. Sewak
53.	<i>Drepanocerus sinicus</i> Harold*	Junagarh Rajkot	6 5	3 rd and 4 th Sept., 2004 08-09-2004	R. Sewak R. Sewak

Sl. No.	Name of Species	Name of District	No. of Example(S)	Date of Collection	Name of Collector
54.	<i>Drepanocerus runicus</i> Arrow*	Junagarh	2	08-09-2004	R. Sewak
55.	<i>Drepanocerus exsul</i> (Sharp)	Junagarh	4	13-08-1988, 2 nd and 4 th Sept., 2004 08-03-1986	R. N. Bhargva
		Jamnagar	12	01-09-2004	R. Sewak
		Porbandar	25	05-09-2004	R. Sewak
		Rajkot	9	13-03-1986	R. Sewak
		Surendranagar	17	08-09-2004	R. Sewak
56.	<i>Onitis siva</i> Gillet*	Banaskantha	3	12-10-1984	V. C. Agrawal
57.	<i>Onitis lama</i> Lansberge*	Ahemdabad	4	13-12-2005	R. Sewak
		Banaskantha	11	05-12-2005	R. Sewak
		Mahesana	5	15-12-2005	R. Sewak
		Patan	6	06-12-2005	R. Sewak
		Rajkot	14	07-09-2004	R. Sewak
58.	<i>Onitis falcatus</i> (Wulfen)	Kuchchh	11	05 th and 7 th Dec., 1993	R. Sewak
59.	<i>Onitis philemon</i>	Ahemdabad	8	06-09-1991	R. Sewak
		Fabricius		20-08-1991 3 rd and 6 th Dec., 2005	
		Banaskantha	12	03-09-1992, 2 nd and 4 th Sept., 2004	R. Sewak
		Junagarh	15	07-12-1993, 26 th , 27 th , 8 th Aug., 2004	R. Sewak
		Kuchchh	20	08-12-2005	R. Sewak
		Patan	8	01-09-2004	R. Sewak
		Porbandar	7	5 th , 6 th and 7 th Sept. 2004	R. Sewak
		Rajkot	14	08-09-2004	R. Sewak
		Surendranagar	22	15-12-2004	R. Sewak
60.	<i>Chiroitis indicus</i> Lansberge	Jamnagar	4	26-08-1990	R. Sewak
		Rajkot	2	08-09-1990	R. Sewak

DISCUSSION

So far sixty species belonging to twelve genera have been recorded from the Thar Desert of Gujarat, which are collected from the dung of cow, buffalo, horse, camel, donky, goat, sheep, bluebull, sambhar, blackbuck, cheetal, hyna, pig and human feacal matter. The subfamily Copinae (Scarabaeidae) is divided into four tribes: Scarabaeini, Sisyphini, Coprini and Panelini on the basis of leg's structure. The representatives of tribes Sisyphini and Panelini had not been found. Out of sixty species three belong to tribe Scarabaeini and remaining fifty seven to Coprini. Thirty eight species have been recorded for the first time from Thar Desert of Gujarat. The species belonging to genera *Gymnopleurus* and some of *Onthophagus* are boll roller and remaining are found under the dung or hide in dung burrows upto two inch to two feet depth and not a single species never found on living substances. The species of tribe Coprini are sexually differentiate by presence of cephalic or prothoracic horns, provinence in mâles and carina in female. The size of species varies from 4mm. to 50mm. length and 3mm. to 40mm. in breadth and differ in colours. The species *Heliocopris gigas* Linnaeus is largest (30mm to 50mm in length and 18mm to 30mm in breadth) and species of genera *Caccobius* are very small (3mm to 7.5mm in length and 2mm to 3.5mm in breadth). The various species of the genus *Caccobius* and *Oniticellus* serve as intermediate hosts for parasitic worms of genus *Gongylonema*, which causes disease in cattles.

SUMMARY

The sixty species belonging to twelve genera were recorded from the Thar Desert of Gujarat. Out of these, thirty eight species have been reported for the first time from Gujarat. The genera recorded with their number of species in descending order includes 3 species of genus *Gymnopleurus* Illiger, single species of *Heliocorpis* Burmeister, 3 species of *Catharsius* Hope, 7 species of *Copris* Geoffroy, 4 species of *Phalops* Erichson, 8 species of *Caccobius* Thomson, 22 species of *Onthophagus* Latreille, 4 species of *Oniticellus* Serville, 3 species of *Drepanocerus* Kirby, 4 species of *Onitis* Fabricius and single species of *Chironitis* Lansberge. The identification keys of tribes, genera and species of subfamily coprinae is followed by systematic account, synonym, localities and distribution tables. The database will be useful as a baseline work for the future workers.

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