

# ~~Larvae~~ of Geotrupinae

With Keys to Tribes and Genera  
(Coleoptera: Scarabaeidae)

By P. O. RITCHER



Agricultural Experiment Station  
University of Kentucky  
Lexington

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## BIBLIOGRAPHY

- ARROW, G. J.  
1904. Sound-production in the lamellicorn beetles. Ent. Soc. London Trans. (4):709-750.
- BLANCHARD, F.  
1888-90. Some account of our species of *Geotrupes*. Psyche 5:103-110.
- BOUCOMONT, A.  
1902. Coleoptera Lamellicornia: Fam. Geotrupidae. Genera Insectorum 7:1-20.  
1912. Scarabaeidae: Taurocerastinae, Geotrupinae. Coleopterum Catalogus 46: 1-47. Edited by S. Schenking. W. Junk, Berlin.
- BOVING, A. G. and CRAIGHEAD, F. C.  
1930-31. An illustrated synopsis of the principal larval forms of the order Coleoptera. Ent. Amer. 11 (N.S.) (1-4):351 pages.
- BROWN, W. J.  
1928. Two new species of *Bolbocerosoma* with notes on the habits and genitalia of other species. Canad. Ent. 60:192-196.
- DAVIS, A. C.  
1934. A revision of the genus *Pleocomma*. South. Calif. Acad. Sci. Bul. 33(3): 123-130. Continued in 34 (1):4-36.
- DAWSON, R. W. and McCOLLOCH, J. W.  
1924. New species of *Bolbocerosoma*. Canad. Ent. 56:9-15.
- EMDEN, F. I. VAN  
1941. Larvae of British beetles. II. A key to the British lamellicornia larvae. Ent. Monthly Mag. 77:117-127, 181-192.
- FABRE, J. H.  
1912. Social life in the insect world, Ch. 16: A truffle-hunter: the *Bolboceras gallicus*. Trans. by Bernard Miall. The Century Company, N. Y. pp. 217-237.
- GERSTAEKER, C. E. A.  
1883. Ueber die Stellung der Gattung *Pleocomma* Lec. in System der Lamellicornier. Ent. Zeitung (Stettin) 44:436-450. Translation by J. B. Smith found in Ent. Amer. 3:202-11.
- GOLOVIANKO, Z. S.  
1936. Les larves plus communes des Coleopteres lamellicornes de la partie europeenne de l' U. R. S. S.-Tahl. Analyt. Fn. U. R. S. S., 20, Inst. Zool. Acad. Sci. U. R. S. S., 1-65, 70 figs. (In Russian).
- HORN, G. H.  
1883. *Pleocomma* Lec. Its systematic position and indication of new species. Ent. Amer. 3:233-5.  
1888. Review of the species of *Pleocomma* with a discussion of its systematic position in the Scarabaeidae. Amer. Ent. Soc. Trans. 15:1-18.
- LENG, C. W.  
1920. Catalogue of the Coleoptera of America, North of Mexico. John D. Sherman, Jr., Mt. Vernon, N. Y.
- LINSLEY, E. G.  
1938. Notes on the habits, distribution, and status of some species of *Pleocomma*. Pan-Pacific Ent. 14:49-58, 97-104.  
1941. Additional observations and descriptions of some species of *Pleocomma*. Pan-Pacific Ent. 17 (4):145-152.  
1945. Further notes on some species of *Pleocomma* (Coleoptera, Scarabaeidae). Pan-Pacific Ent. 21(3):110-114.
- LINSLEY, E. G. and MICHENER, C. D.  
1943. Observations on some Coleoptera, from the vicinity of Mt. Lassen, California. Pan-Pacific Ent. 19(2):75-79. Found larvae and pupae of *Odontaeus obesus* Lec.

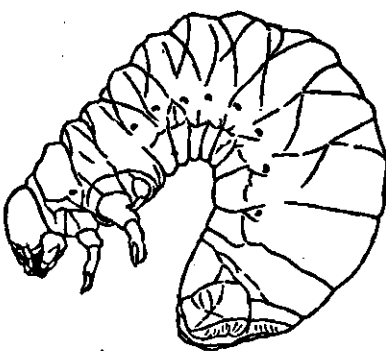
- LODING, H. P.  
1935. *Geotrupes ulkei* Blanchard. Brooklyn Ent. Soc. Bul. 30:108.
- MANEE, A. H.  
1908. Some observations at Southern Pines, N. Carolina. Ent. News 19 (Dec.): 459-462. Biology of *Eucanthus lazarus* (Fab.) and *Bolboceras ferrugineus* (Beauv.).
- OSTEN SACKEN, R.  
1874-76. Description of the larva of *Pleocoma*, Lec. Amer. Ent. Soc. Trans. 5: 84-87.
- PAULIAN, R.  
1939. Les caracteres larvaires des Geotrupidae (Col.) et leur importance pour la position systematique du groupe. Soc. Zool. de France Bul. 64:351-360.  
1941. La position systematique du genre *Pleocoma* Le Conte. (Col. Scarabaeidae). (Rev. Franc. d' Ent. 8 (3):151-155.
- PERRIS, E.  
1876. Larves des Coleopteres: Lamellicornes et Pectinicornes. Annales de la Societe Lineenne de Lyon 22:91-122.
- RITCHER, P. O.  
1940. Kentucky white grubs. Ky. Agr. Expt. Sta. Bul. 401.  
1943. The Anomalini of eastern North America with descriptions of the larvae and key to species (Coleoptera: Scarabaeidae). Ky. Agr. Expt. Sta. Bul. 442.  
1944. Dynastinae of North America with descriptions of the larvae and keys to genera and species (Coleoptera: Scarabaeidae). Ky. Agr. Expt. Sta. Bul. 467.  
1945a. Rutelinae of eastern North America with descriptions of the larvae of *Strigodermella pygmaea* (Fab.) and three species of the tribe Rutelini (Coleoptera: Scarabaeidae). Ky. Agr. Expt. Sta. Bul. 471.  
1945b. North American Cetoniinae with descriptions of their larvae and keys to genera and species (Coleoptera: Scarabaeidae). Ky. Agr. Expt. Sta. Bul. 476.  
1945c. Coprinae of eastern North America with descriptions of larvae and keys to genera and species (Coleoptera: Scarabaeidae). Ky. Agr. Expt. Sta. Bul. 477.  
1947. Description of the larva of *Pleoroma hirticollis vandykei* Linsley (Coleoptera: Scarabaeidae). Pan-Pacific Ent. 23 (1):11-20.
- SCHIODTE, I. C.  
1874. De metamorphosi eleutheratorum observationes: hidreg til insekternes udviklings-histoire. Pars 8, Scarabaei. Saetryk of Naturh. Tidsskr. (ser. 3) 9:227-376.
- SIM, R. J.  
1930. Scarabaeidae, Coleoptera; observations on species unrecorded or little known in New Jersey. N. Y. Jour. Ent. Soc. 38 (2):139-147. Biologies of *Odontaeus*, *Bolbocerosoma*, and *Eucanthus*.
- SMITH, R. F. and POTTS, R. W. L.  
1945. Biological notes on *Pleocoma hirticollis vandykei* Linsley (Coleoptera: Scarabaeidae). Pan-Pacific Ent. 21 (3):115-118.
- WALLIS, J. B.  
1928. Revision of the genus *Odontaeus*. Dej. (Scarabaeidae, Coleoptera). Canad. Ent. 60:119-128, 151-156, 168, 176.

## Plate I

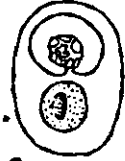
- Fig. 1. *Geotrupes blackburni* (Fab.). Third-stage larva, left lateral view (setation omitted).
- Fig. 2. *Odontaeus simi* Wallis. Thoracic spiracle.
- Fig. 3. *Lethrus apterus* Laxm. (After Golovianko). Third-stage larva, left lateral view (setation omitted).
- Fig. 4. *Eucanthus lazarus* (Fab.). Thoracic spiracle.
- Fig. 5. *Eucanthus lazarus* (Fab.). Third-stage larva, left lateral view (setation omitted).
- Fig. 6. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Thoracic spiracle.
- Fig. 7. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Third-stage larva, left lateral view (setation omitted).
- Fig. 8. *Pleocoma hirticollis vandykei* Linsley. Third-stage larva, left lateral view.
- Fig. 9. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Third abdominal segment, left lateral view.
- Fig. 10. *Pleocoma hirticollis vandykei* Linsley. Third abdominal segment, left lateral view.

## Symbols Used on Plate I

|                     |                      |
|---------------------|----------------------|
| EUS—Eusternum.      | SP—Spiracle.         |
| PEA—Pedal area.     | SCL—Scutellum.       |
| PLL—Pleural lobe.   | SCU—Scutum.          |
| PRSC—Prescutum.     | SPA—Spiracular area. |
| PSCL—Postscutellum. |                      |

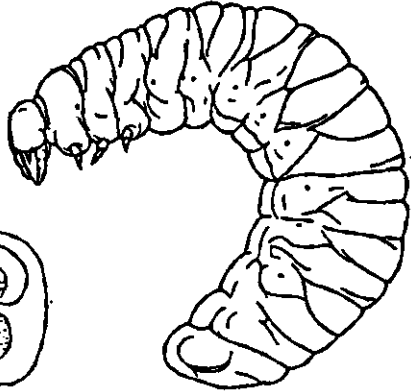


C. BLACKBURNI



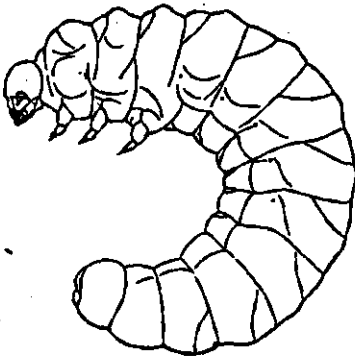
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G. SIMI



3

L. APTERUS  
AFTER GOLDFAHN



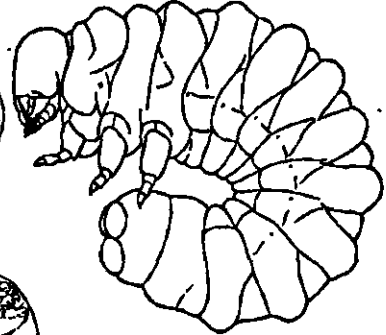
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E. LAZARUS



5

E. LAZARUS



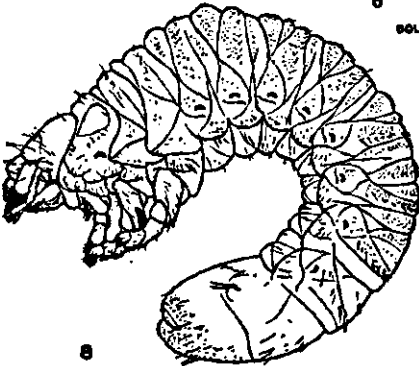
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BOLBOCEROSOMA



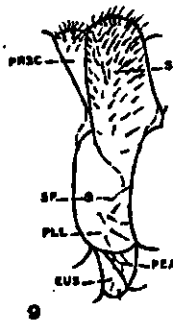
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BOLBOCEROSOMA



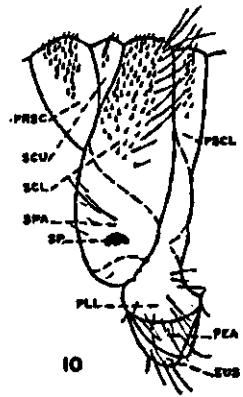
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P. HIRTICOLLIS  
VANDYKEI



9

BOLBOCEROSOMA



10

P. HIRTICOLLIS  
VANDYKEI

## Plate II

- Fig. 11. *Geotrupes blackburni* (Fab.). Head.  
 Fig. 12. *Pleocoma hirticollis vandykei* Linsley. Head.  
 Fig. 13. *Odontaeus simi* Wallis. Head.  
 Fig. 14. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Head.  
 Fig. 15. *Eucanthus lazarus* (Fab.). Head.  
 Fig. 16. *Odontaeus simi* Wallis. Left mandible, dorsal view.  
 Fig. 17. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Left mandible, dorsal view.  
 Fig. 18. *Eucanthus lazarus* (Fab.). Left mandible, dorsal view.  
 Fig. 19. *Eucanthus lazarus* (Fab.). Right mandible, dorsal view.  
 Fig. 20. *Pleocoma hirticollis vandykei* Linsley. Left mandible, dorsal view.  
 Fig. 21. *Pleocoma hirticollis vandykei* Linsley. Left mandible, ventral view.  
 Fig. 22. *Geotrupes blackburni* (Fab.). Left mandible, dorsal view.  
 Fig. 23. *Geotrupes blackburni* (Fab.). Right mandible, dorsal view.

## Symbols Used on Plate II

- |                                      |                              |
|--------------------------------------|------------------------------|
| A—Antenna.                           | L—Labrum.                    |
| AA—Setae of anterior angle of frons. | MO—Molar region.             |
| AF—Anterior frontal setae.           | PA—Preartitis.               |
| BR—Brustia.                          | PC—Preclypeus.               |
| DMS—Dorso-molar setae.               | PFS—Posterior frontal setae. |
| E—Epicranium.                        | PSC—Postclypeus.             |
| EFS—Exterior frontal setae.          | PTA—Postartitis.             |
| ES—Epicranial suture.                | SA—Scissorial area.          |
| F—Frons.                             | VP—Ventral process.          |
| FS—Frontal suture.                   |                              |

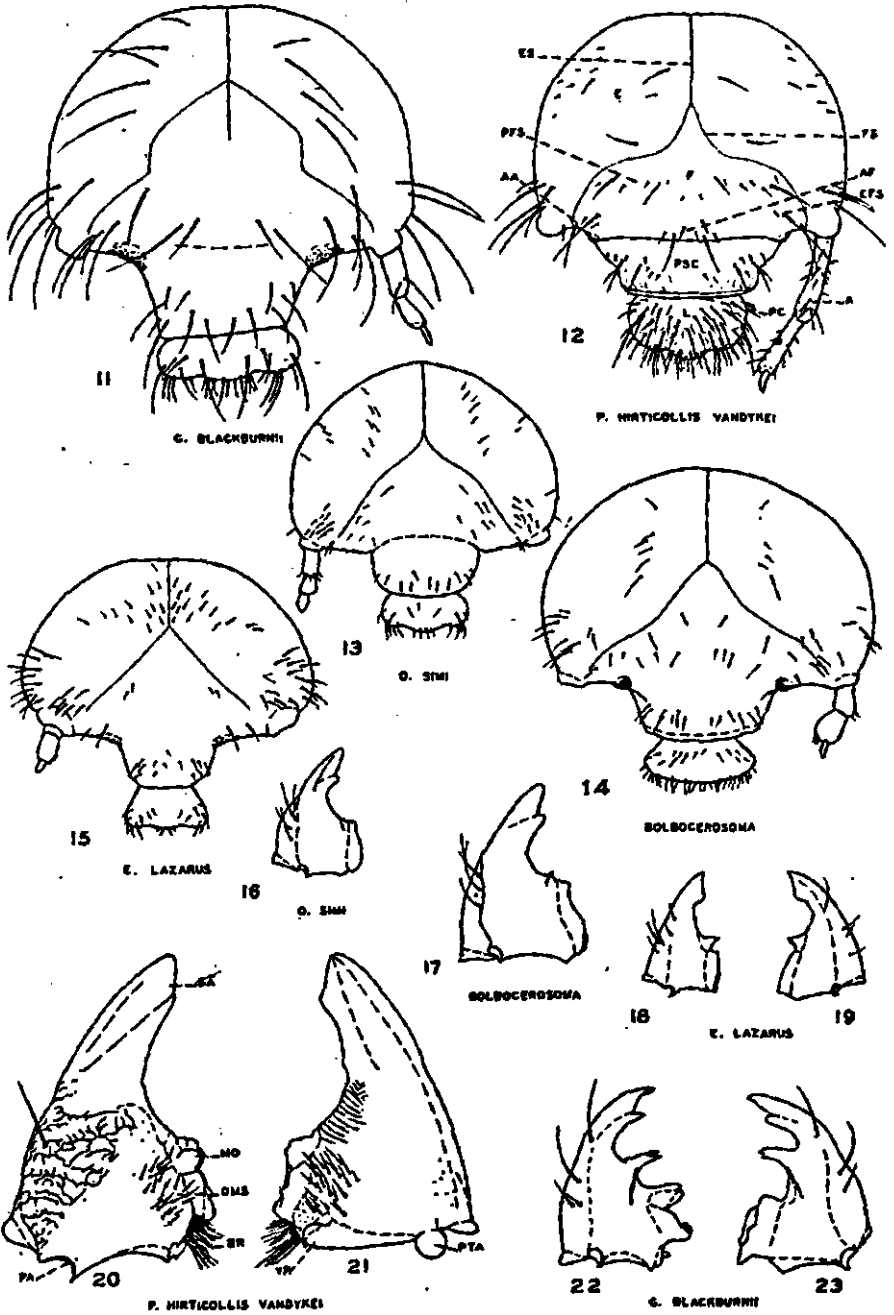


PLATE II



## Plate III

- Fig. 24. *Geotrupes blackburni* (Fab.). Left metathoracic and mesothoracic legs, lateral view.
- Fig. 25. *Odontaeus simi* Wallis. Left mesothoracic leg, lateral view.
- Fig. 26. *Pleocoma hirticollis vandykei* Linsley. Proximal portion of left mesothoracic leg, lateral view.
- Fig. 27. *Eucanthus lazarus* (Fab.). Left metathoracic leg, lateral view.
- Fig. 28. *Geotrupes blackburni* (Fab.). Left metathoracic leg.
- Fig. 29. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Left metathoracic leg, lateral view.
- Fig. 30. *Eucanthus lazarus* (Fab.). Left maxilla, labium and hypopharynx.
- Fig. 31. *Odontaeus simi* Wallis. Left metathoracic leg.
- Fig. 32. *Geotrupes blackburni* (Fab.). Left maxilla, labium and hypopharynx.
- Fig. 33. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Right maxilla, labium and hypopharynx.
- Fig. 34. *Odontaeus simi* Wallis. Right maxilla, labium and hypopharynx, dorsal view.
- Fig. 35. *Pleocoma hirticollis vandykei* Linsley. Right metathoracic leg.
- Fig. 36. *Pleocoma hirticollis vandykei* Linsley. Left maxilla, dorsal view.
- Fig. 37. *Pleocoma hirticollis vandykei* Linsley. Labium and hypopharynx, dorsal view.
- Fig. 38. *Pleocoma hirticollis vandykei* Linsley. Right maxilla and labium, ventral view.

## Symbols Used on Plate III

CAR—Cardo.

CL—Claw.

CX—Coxa.

FE—Femur.

FOS—Fossorial setae.

G—Galea.

GL—Glossa.

HP—Hypopharynx.

LA—Lacinia.

LL—Lateral lobe.

LP—Labial palpus.

MP—Maxillary palpus.

O—Oncylus.

PMP—Postmentum.

PRM—Prementum.

SD—Stridulating area.

ST—Stipes.

TR—Trochanter.

TT—Tibiotarsus.

UN—Uncus.

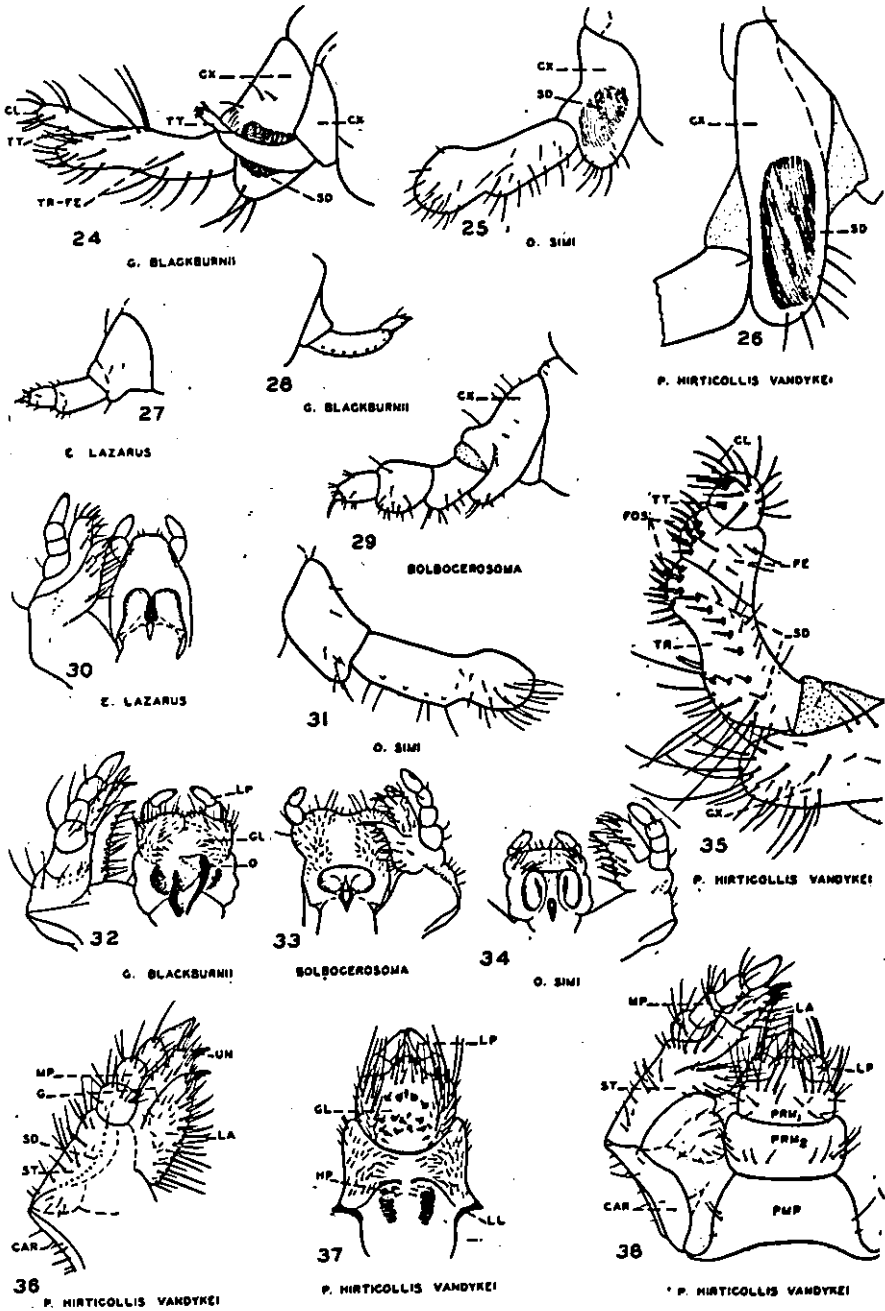


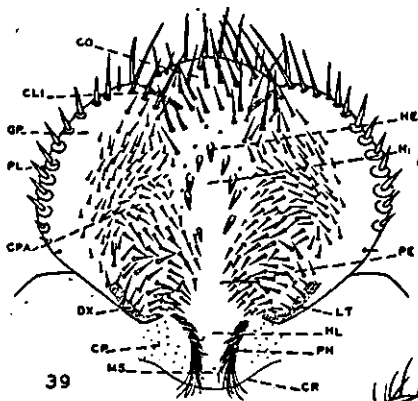
PLATE III

## Plate IV

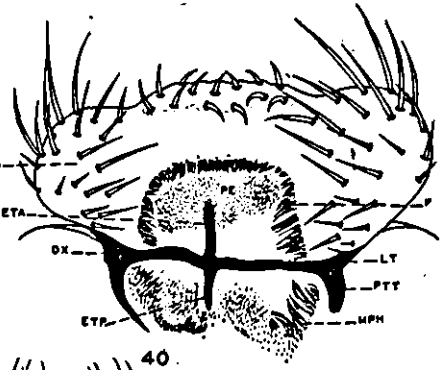
- Fig. 39. *Pleocoma hirticollis vandykei* Linsley. Epipharynx.  
 Fig. 40. *Geotrupes blackburni* (Fab.). Epipharynx.  
 Fig. 41. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Epipharynx.  
 Fig. 42. *Odontaeus simi* Wallis. Epipharynx.  
 Fig. 43. *Eucanthus lazarus* (Fab.). Epipharynx.  
 Fig. 44. *Geotrupes ulkei* Blanch. Caudal view of last abdominal segment.  
 Fig. 45. *Geotrupes blackburni* (Fab.). Caudal view of last abdominal segment.  
 Fig. 46. *Odontaeus simi* Wallis. Caudal view of last abdominal segment.  
 Fig. 47. *Typhoeus typhoeus* L. Caudal view of last abdominal segment (After van Emden).  
 Fig. 48. *Lethrus apterus* Laxm. Caudal view of last abdominal segment (After Golovianko).  
 Fig. 49. *Bolbocerosoma* (prob. *tumefactum* [Beauv.]). Caudal view of last abdominal segment.  
 Fig. 50. *Pleocoma hirticollis vandykei* Linsley. Caudal view of last abdominal segment.

## Symbols Used on Plate IV

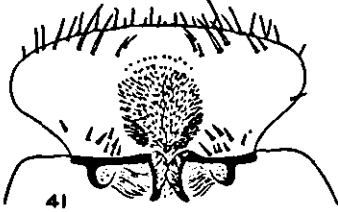
|                          |                       |
|--------------------------|-----------------------|
| ASL—Anal slit.           | HE—Helus.             |
| CLI—Clithrum.            | HL—Haptolachus.       |
| CO—Corypha.              | LL—Lateral lobe.      |
| CP—Crepidial punctures.  | LT—Laeotorma.         |
| CR—Crepis.               | MPH—Mesophoba.        |
| CPA—Chaetoparia.         | MS—Macrosensilla.     |
| DAL—Dorsal anal lobe.    | PE—Pedium.            |
| DX—Dexiotorma.           | PH—Phoba.             |
| ESF—Endoskeletal figure. | PL—Plegma.            |
| ETA—Anterior epitorma.   | PTT—Pternotorma.      |
| ETP—Posterior epitorma.  | T—Teges.              |
| GP—Gymnoparia.           | VAL—Ventral anal lip. |
| H—Haptomerum.            |                       |



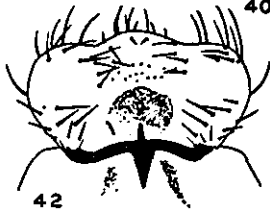
P. HIRTICOLLIS VANDYKEI



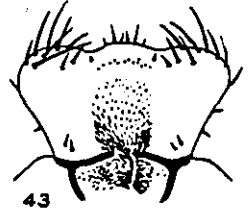
G. BLACKBURNII



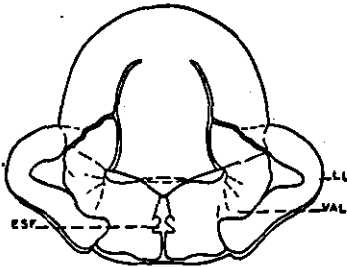
BOLBOCEROSOMA



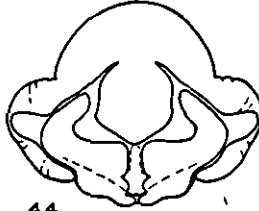
O. SIMI



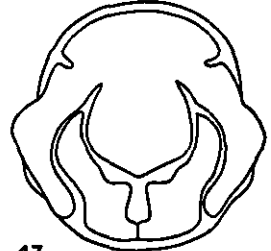
E. LAZARUS



G. BLACKBURNII



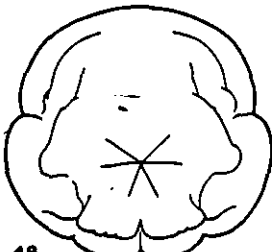
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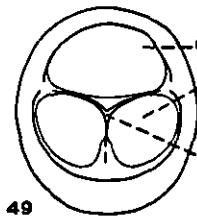
T. TYPHOEUS  
AFTER VAN EMBDE



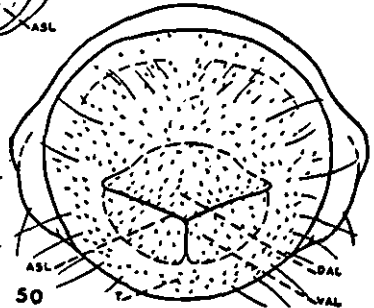
O. SIMI



L. APTERUS  
AFTER COLOMANNO



BOLBOCEROSOMA



P. HIRTICOLLIS VANDYKEI

PLATE IV