

Review of *Lanelater* of North America (Coleoptera, Elateridae)

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ABSTRACT

Descriptions, illustrations, and distributions of adults of 3 species: *schottii* (=arizonae) from Arizona to southern Texas and northern Mexico; *hayekae* n. sp. (=schottii of authors) from Kansas to southern Texas; *sallei* from Louisiana to Florida to New York. Identification key. The larvae, unknown, are undoubtedly predaceous on larvae (grubs) of Scarabaeidae and other soft bodied insects.

Introduction

Since Eschscholtz established the genus *Agrypnus* in 1829 various students of the Elateridae have transferred some groups of his species to new or existing genera. Laporte in 1840 transferred a few species into the new genus *Amaurus*. Then Arnett in 1952, because of a homonymy, proposed the name *Lanelater* for *Amaurus*. *Lanelater* Arnett, with 80 species found in all parts of the world except South America, contains only 3 species in North America: *sallei* (LeConte) occurs in coastal states from Louisiana to Florida to New York; *schottii* (LeConte) (=arizonae Candèze) occurs in southern Arizona and New Mexico, western and southern Texas, and in Coahuila, Mexico; *hayekae* n. sp. (=schottii of authors, not LeConte) occurs in Kansas, Oklahoma, and southward to south Texas (fig. 1). Because these species are possibly beneficial and because they have been so greatly confused in the past, I am here attempting to clarify methods of identification, distribution patterns, and nomenclature.

Very little is known of the biology of species of *Lanelater*. Recorded associations of adults with various plants are undoubtedly fortuitous; surely adults of *Lanelater*, like most elaterid adults, do very little feeding if any and are not necessarily associated with the same plant and never with the same animal species on which the larva fed. The larvae of these three species of *Lanelater* have never been described in print. However, Gary W.

Ulrich, University of California at Berkeley, has examined *Lanelater* larvae from Florida and will soon publish a description. Those larvae had not been reared to adulthood, but Ulrich was able to identify them to genus by comparing them with reared larvae from Australia. According to my distributional studies, the Floridian larvae would be *sallei*. Because *Lanelater* larvae from other parts of the world are predaceous, North American *Lanelater* larvae, found in rotten logs, are undoubtedly also predaceous. Ulrich twice informed me, in correspondence, of two incidents of exotic *Lanelater* larvae that were predaceous on larvae of Scarabaeidae. In his latest report the larvae were in stocks of sugar cane. Such predaceous elaterid larvae undoubtedly play an important though little understood role in the control of pests.

Placing previous literature citations of specific names in a complete synonymy can be difficult in a genus in which many misidentifications have been made. In *Lanelater* even though the names *schottii* and *arizonae* have been confused in the literature, I have assumed an author's usage of names was correct unless obviously incorrect. For example, it is obvious that Leng (1920:166) in his catalogue was listing three species; therefore, I have placed *schottii* of Leng in synonymy with *hayekae* n. sp., not in synonymy with the true *schottii* (LeConte). It is also obvious that any *Lanelater* specimens recorded from New Orleans, Louisiana, and eastward are *sallei* and that specimens from Arizona, New Mexico, and west Texas are *schottii*.

It has been stated, incorrectly, that *Dicronychus* Laporte 1836 is a synonym of *Lanelater*. The confusion arose because Laporte used the specific name *senegalensis* twice: *Amaurus senegalensis* Laporte 1840:237, and *Dicronychus senegalensis* Laporte 1840:251. The former species is now a junior synonym of *Lanelater notodonta* (Latreille 1823); the latter is now in the genus *Anisomerus* Schwarz in the family Dicronychidae.

Lanelater was placed in the Adelocerina of the Pyrophorinae: Pyrophorini by Arnett (1969:11) and in Agrypninae without tribal subdivisions by Hayek (1973:7; 1979:184). Adelocerina of Arnett and Agrypninae of Hayek are synonymous. The nomenclature of *Lanelater* and the relationship between *Lanelater* and *Pyrophorus* and allies have been discussed by Hayek (1973:240; 1979:251).

What is the type-species of *Lanelater*? There seems to be a bit of confusion. Arnett said at the beginning of his discussion that his *Lanelater* is a new genus, and he designated *Agrypnus schottii* LeConte as type-species. However, it is probable that *Lanelater* should be considered merely a replacement name for an older preoccupied generic name; *Lanelater* would then assume the type-species of the earlier preoccupied name. The sequence of events and names is as follows. The oldest available generic name for this genus is *Amaurus* Laporte (1840:237), but the name is not valid because it is preoccupied by *Amaurus* Burmeister 1835 in the Hemiptera. Because Arnett indicated that *Amaurus* Laporte, though preoccupied, is the oldest available name for this genus, he was actually proposing a new name, not a new genus. In fact, in the middle of his discussion he says, "I therefore propose the new generic name, *Lanelater*..." and he does not give a separate formal generic diagnosis or description that would normally accompany a new genus. I therefore believe that the type-species of *Lanelater* is *Amaurus senegalensis* Laporte 1840 (= *Elater notodontus* Latreille 1823), by automatically assuming the type-species of *Amaurus* Laporte 1840, the replaced name. Because *Elater notodontus* (= *senegalensis*) and *schottii* are surely congeneric, this reinterpretation of the type-species will not affect current usage of *Lanelater* or any of its species.

The internal female genitalia of *Lanelater sallei* are herein illustrated and somewhat lengthily described, even though like structures have not been investigated for most other relatives of *Lanelater*. Perhaps these structures will be used more in the future to show relationships. I have patterned my presentation of internal female genitalia after that of Mathieu (1961:459-480, figs. 14, 20) for *Melanactes* LeConte and *Pseudomelanactes* Mathieu.

Abbreviations, etc.: In recording specimen label data and literature record

data I have listed the locality, the date with lower case roman numerals indicating month, the collector(s) (only for the new species), and the number of males (*m*), females (*f*), sex-unknowns (?) in a museum. Four letter codens for museums or collectors that lent specimens will be found in the acknowledgement section near the end of this article.

Lanelater Arnett

Agrypnus of authors, not Eschscholtz

1829:32. LeConte 1861:164. LeConte and Horn 1883:180. Leng 1920:166. Bradley 1930:122.

Amaurus Laporte 1840:237 (preoccupied by Burmeister 1835).

Lanelater Arnett 1952:104, 105; 1955:608, 611; 1962:500; 1969:9. Mathieu 1961:477. Hayek 1973:7, 240; 1979:184, 246, 251.

Diagnosis. Antennomere 3 longer than 2, usually much slenderer than 4 but rarely broadly triangular. Pronotum simple, without constriction behind anterior corners; lateral carina present; supra-marginal carina present on posterior half or less; with broad median tubercle near base. Scutellum simple, without longitudinal carina. Elytra with punctate striae. Prothoracic hypomeron and metasternum without depressions or grooves for accommodation of tarsi I and II. Pronotosternal suture deeply and distinctly grooved for reception of antenna; this antennal groove extending to very near procoxal cavity but slightly variable in depth at posterior end. Mesepisternum and mesepimeron form part of margin of meso-coxal cavity. Tibial spurs present. Tarsi simple, without ventral lobes. Each claw bearing a group of 2 or 3 setae near base. Body clothed with setae; scales entirely absent. Males usually smaller than females and with longer antennae. Male genitalia with parameres heavily sclerotized and apically truncate or moderately elongate. Female genitalia (fig. 2) (described from external apex anteriorad): Ovipositor with long coxites, without styli. From gonopore vagina is a simple slender tube that expands into a genital chamber. Chamber with 2 very heavily sclerotized opposing invaginations that are smooth, sharply longitudinally acute internally (i.e., on inside of genital chamber) and hollowed externally (i.e., on outside of genital chamber); invaginations almost joined ventrally by strap-like parts. (Perhaps these invaginations act as valves.) Anteriorly chamber with 3 large bulbous

sacs. Then bursa copulatrix is a long contorted tube with 2 rows of long, anteriorly directed, internal spicules and a third row of like spicules both anteriorly and posteriorly; bursa triangular in

area of 3 rows of spicules; bursa anteriorly with blunt end. From end of bursa arise 2 slender spiraled spermathecae; approximately 8 turns in each spiral.

Key to the New World species of *Lanelater*

1. Tibia I with anterior carina on dorsal surface (in cross section, anterior edge of dorsal surface angled, fig. 9). Pronotum with supramarginal carina sharp and extending forward of midlength (fig. 4). Kansas to Texas. *hayekae* Spilman

Tibia I without carina on dorsal surface (in cross section, anterior edge of dorsal surface rounded, figs. 10, 11). Pronotum with supramarginal carina dull or if sharp then not extending forward of midlength (figs. 3, 5). 2

2. Pronotum with supramarginal carina dull; pronotal punctures large, cribrate overall (fig. 5). Elytron with basal half of lateral striae having broad sharply delimited sulcus connecting punctures. Setae strongly arched on lateral areas of pronotum and elytra. Texas to Mexico to Arizona. *schottii* (LeConte)

Pronotum with supramarginal carina sharp; pronotal punctures small, cribrate only near lateral borders (fig. 3). Elytron with lateral striae not having sulcus connecting punctures. Setae weakly arched or recumbent on lateral areas of pronotum and elytra. Louisiana to Florida to New York. *sallei* (LeConte)

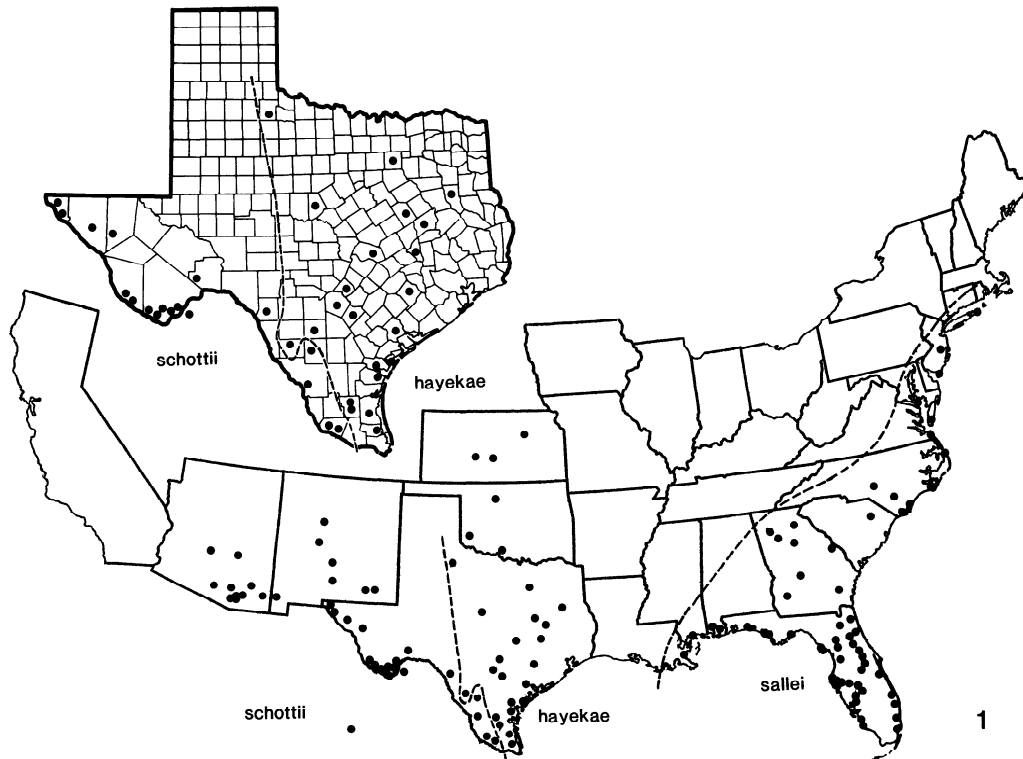


Figure 1. *Lanelater* spp., distribution. Inset, Texas, county distribution of *schottii* and *sallei*.

Lanelater sallei (LeConte)

Agrypnus sallei LeConte 1853:491.
 Candèze 1857:36. Lacordaire 1857:139.
 Schwarz 1878:452. Smith 1900:246. Leng
 1920:166. Schenkling 1925:8. Davis
 1932:213. Brimley 1938:164. Dietrich
 1945:7. Löding 1945:59; Fattig 1951:4.
 Wickham 1910:401.

Lanelater sallei: Arnett 1952:106. Kirk
 1969:47. Hayek 1973:262.

Lanelater sp.: Richmond 1962:87.

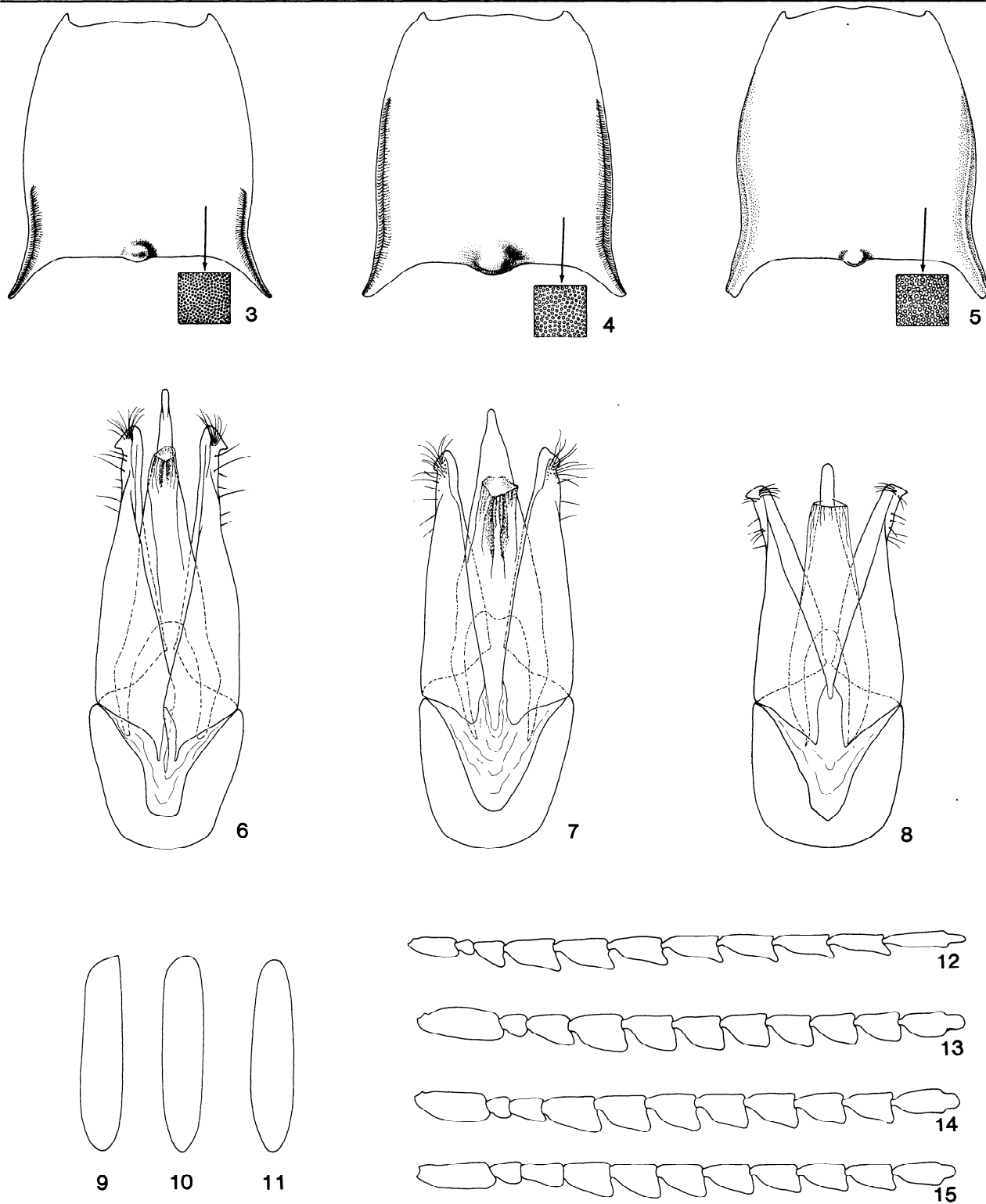
Diagnosis. Antenna long, obviously longer in male than in female, male with 2-4 and female with 0-1 antennomeres extending beyond posterior border of coxa I; 3 moderately expanded apically (apical width 70% of length); 4-10 in male (fig. 12) long and obviously incurved on ventral border, 4-10 in female (fig. 13) shorter and very weakly or not at all incurved on ventral border; 11 long and often very strongly and abruptly narrowed at apical third; 1 and 2 shiny, 3 shiny if slender or dull if broad, 4-11 dull. Pronotum (fig. 3) with lateral marginal carina and supramarginal carina sharp, the latter becoming obsolete at basal 1/3 of pronotal length; posterior corners almost acute apically, usually attenuate and slender, usually prolonged and strongly arcuately diverging; dorsally with punctures small, dense, those near lateral borders cribrate. Elytra having stria punctures small and interconnecting groove on base of stria 9; interval punctures minute. Ventral surfaces with small, very dense punctures and setae laterally, except with

larger, sparser punctures on prosternum. Antennal groove long, reaching border of procoxal cavity but usually gradually shallow posteriorly. Tibia I in cross section (fig. 11) with anterior edge of dorsal surface rounded, dorsal surface therefore rounded along whole tibia; tibia I narrower than in *hayekae*, narrowed to base; male with legs much longer than in female. Setae of pronotum and elytra whitish or yellowish, moderately long, weakly arched, often recumbent. Male genitalia (fig. 6) having parameres straight, apex oblique, slenderer than in *hayekae*; basal piece narrow; penis in dorsal view slender, with apex in lateral view narrow and slightly inclined ventrally; gonopore narrow and with well-sclerotized setae. Female genitalia having ovipositor with coxites well sclerotized over all, usually long and slender; valvifers usually longer than in *hayekae* and *schottii*, length of valvifer is 75-78% (average 77%) length of coxite; proctiger long, apex usually extending beyond and between bases of coxites; sclerotized invaginations of genital chamber obviously unequal in size, one large and one small. Length 22-30 mm.

Distribution. From New Orleans, Louisiana, eastward to Florida and then northward to Long Island, New York; recorded from every intervening coastal state except Delaware. Confined to coastal areas from Virginia northward. Many localities are in sandy areas. Most specimens seen by me were collected in Florida. Robert E. Woodruff identified and recorded most of



Figure 2. *Lanelater sallei*, female internal genitalia.



Figures 3-15. *Lanelater* spp. 3-5, pronotum, dorsal view: 3-*sallei*; 4-*hayekae*; 5-*schottii*. 6-8, male genitalia, aedeagus: 6-*sallei*; 7-*hayekae*; 8-*schottii*. 9-11, protibia, diagrammatic cross section near apex: 9-*hayekae*; 10-*schottii*; 11-*sallei*. 2-15, antenna: 12-*sallei* male; 13-*sallei* female; 14-*hayekae* male; 15-*schottii* male.

the Floridian specimens in FSCA.

Specimens Examined. UNITED STATES.
ALABAMA. Baldwin Co.: Daphne 1969
lmUSNM.
FLORIDA. Alachua Co.: liv56 1?FSCA;
Gainesville 1v13 lFUSNM, 23iii53
lFCNCI, 27iv68 1?FSCA, 5v64 1?FSCA
lFFMNH, 16iv68 1?FSCA, 29v59 1?FSCA,
30iv59 1?FSCA. Baker Co.: Trail Ridge
12v59 2?FSCA; MacClenny 29iv59 1?FSCA, 8v59
lFFMNH. Bay Co.: St. Andrews State
Park 19iv63 FSCA; Sunnyside 18vi52
lFFMNH. Bradford Co.: 1,2v59 5?FSCA.
Brevard Co.: Melbourne 16iii38 2mUSNM,
24iii38 2mUSNM, iii38 4mUSNM. Broward
Co.: Fort Lauderdale 30iii20 lFCNCI.
Charlotte Co.: Cleveland 26iv21 lFFMNH;
Punta Gorda 17iv40 lFFMNH. Citrus Co.:
Inverness 25iv43 lFFMNH. Collier Co.:
Naples 1mAMNH, 29iii47 lFCASC. Dade
Co.: vii49 1?FSCA; Coral Gables 10viii46
lFFMNH; Miami liv 1FFMNH, 20vii39
2lvii31 2mFFMNH, 6vii37 lFFMNH, 27viii6
lmlFUSNM, v20 lmUSNM, 19viii33
lmUSNM, vi48 1?FSCA, 15ix35 FSCA, 3vii64
FSCA. De Soto Co.: lmUSNM. Duval
Co.: Atlantic Beach 1fAMNH; Jacksonville
2mUSNM, 25iv14 lFCASC; Mayport 2v62
lFFMNH; Pablo Beach near Jacksonville
10v25 lmUSNM. Franklin Co.: Alligator
Point 2lv67 lFUSNM. Highlands Co.:
Archbold Biological Station-Lake Placid
7,9,16,27 6mFFMNH, 2iii53 lFCNCI,
10,13,14iii75 3mCNCI, 7iii47 lFCASC,
30iii62 lmUSNM, 1,2,3,4,5iv73 13mUSNM,
19-20iv58 1?FSCA; Sebring 14iv66 lFCNCI,
14iv66 1?FSCA, 2iii60 FSCA; Lake Letta
Subdivision near Avon Park 3liii61 2?FSCA;
Avon Park 27iv48 1?FSCA. Hillsborough
Co.: Hillsboro ix11 lmUSNM, 1911
lFCASC; Tampa 22iv lmlFUSNM. Indian
River Co.: s of Vero Beach 25vi75
29viii75 2?CNCI. Lake Co.: Camp
McQuarrie 30iv-1v76 3?CNCI. Lee Co.:
Buck Key 1fUSNM; Bonita Springs 3iii62
1?FSCA. Levy Co.: 3lv56 1?FSCA; Cedar
Key 12v70 lmUSNM. Marion Co.:
lFFMNH; 2 mi w Dunnellon 22iv64 3?FSCA;
Juniper Springs 8iv75 1?CNCI. Martin
Co.: vi36 1?FSCA; Port Sewall iii35
lMAMNH, i-iii38 lMAMNH; Stuart 25vi51
lFCASC. Okaloosa Co.: Destin 14-15v48
lFFMNH; Fort Walton Beach 11iv76 lCNCI;
Ocean City 22iv63 1?FSCA. Orange Co.:
Orlando 24iii55 1?FSCA, 23v60 1?FSCA.
Osceola Co.: Kissimmee 2m2fAMNH.
Palm Beach Co.: v36 lFFMNH; Lake Worth
lmUSNM, 2?KSUC; Lake Park 10vii73
1?FSCA. Pinellas Co.: Dunedin lmUSNM,
18ii27 2mCASC; St. Petersburg 7mUSNM;
Long Key-near St. Petersburg 23v36

lmUSNM. Polk Co.: Lakeland iv12
lmUSNM; Winter Haven 10iii55 1?FSCA.
Putnam Co.: Crescent City 2mUSNM;
Welaka-University Reserve 15iv62 4mUSNM;
2 mi s Welaka 20iv73 1?FSCA. St. Johns
Co.: St. Augustine 3iii40 lFCASC.
Volusia Co.: De Leon Springs 13v60
lFCNCI 1?FSCA, 23v60 3?FSCA; Enterprise
17iv03 lmUSNM, 25iv 3FCASC. County
unknown: Sand Point lv 1fUSNM.
MARYLAND. St. Marys Co.: Point Lookout
1vi24 lFUSNM.
MISSISSIPPI. Harrison Co.: Gulfport
20v40 lMEJFC.
NEW JERSEY. Ocean Co.: Lakehurst 7vi41
lmUSNM, 6-8vii50 lFFSCA.
NORTH CAROLINA. Brunswick Co.: Long
Beach 9v51 lmlFCNCI. Carteret Co.:
Beaufort iv74 1?CNCI. Columbus Co.: Lake
Waccamaw 26v84 lMWESC. Dare Co.: Kill
Devil Hills 23-26v52 lFFSCA, 3vii50
lFFSCA. Moore Co.: Southern Pines iv28
lFFMNH, 3v52 7&14&21vii51 l4fCNCI.
New Hanover Co.: 9 mi s of Wilmington
2liv50 lFFSCA.
VIRGINIA. Northampton Co.: Cape
Charles 8-10vi33 2mFFMNH; Cobb Island
lMAMNH. Princess Anne Co.: Virginia
Beach 30v72 lMWESC.
Literature Records. UNITED STATES.
ALABAMA. Baldwin Co. Mobile Co.:
vi&vii (Löding 1945:59).
FLORIDA. (The following localities in
Florida, except Tampa, are from Hayek
1973:263.) Collier Co.: Naples. Duval
Co.: Jacksonville. Highlands Co.: Lake
Placid. Hillsborough Co.: Tampa (Schwarz
1878:452; Wickham 1910:401); Hillsboro.
Martin Co.: Stuart. Pinellas Co.:
Dunedin. St. Johns Co.: St. Augustine.
Volusia Co.: Enterprise.
GEORGIA. Dougherty Co.: Albany v&vi.
Fulton Co.: Atlanta vi&vii. Habersham
Co.: Cornelia vii. Houston Co.: Perry
v. Morgan Co.: Madison vi. Pierce
Co.: Offerman iv. Richmond Co.:
Augusta viii. County unknown:
Centerville v (Fattig 1951:4).
LOUISIANA. Orleans Parrish: New
Orleans (Hayek 1973:263); near New Orleans
(LeConte 1853:491).
MARYLAND. St. Marys Co.: Point Lookout
(Arnett 1952:106).
MISSISSIPPI. Jackson Co.: Horn Island
(Richmond 1962:87).
NEW JERSEY. Cape May Co.: Anglesea ix
(Smith 1900:246).
NEW YORK. Suffolk Co.: East Marion vi
(Davis 1932:213; Dietrich 1945:7).
NORTH CAROLINA. Bladen Co.: White
Lake. Carteret Co.: Beaufort. Moore

Co.: Southern Pines (Brimley 1938:1964).

SOUTH CAROLINA. Florence Co.: Florence v (Kirk 1969:47).

VIRGINIA. Northampton Co.: Hog Island (Arnett 1952:106).

Biology. Very little is known of the habits of *sallei*. The only conclusions deduced from labels are that malt is an attractant and that males are attracted to lights much more than are females. The few associations with plants are undoubtedly accidental, the plant being merely a place for resting. Specimens have been collected in every month from February through September inclusive, but mostly in March through May. Biological data from labels and literature can be summarized as follows. Specimens examined: on *Opuntia* at night, Sebring FL; beach and dunes, Destin FL; under drift wood, Long Beach NC; in sandy oak and pine forest near lake, Lake Waccamaw NC; live oak scrub area on dune, Virginia Beach VA; citrus, Avon Park FL; beating at night, St. Andrews State Park FL; malt trap, Trail Ridge & Bonita Springs FL; malt bait trap, DeLeon Springs & MacClenny FL; in McPhail trap, Palm Beach Co. FL; in can trap, Levy Co. & Alachua Co. FL; trap, Martin Co. FL; malaise trap, various localities FL VA. Literature records: in corn field, Florence SC (Kirk 1969:47); copulating at sugar, Anglesea NJ (Smith 1900:246).

Discussion. The confusion between *sallei*, *schottii*, and *hayekae* results from LeConte's original description and collection. LeConte (1853:491) listed *sallei* from "near New Orleans" and "in abundance on the lower Rio Grande, at Eagle Pass." The specimen with the brick red paper disk (=Southern States) in the LeConte Collection had always been considered the type and was eventually designated lectotype by Hayek (1973:262). The specimens from near New Orleans LA and from Eagle Pass TX can not be found; at least they are not so labeled in the LeConte Collection. Nevertheless, the Eagle Pass specimens could not have been *sallei* because *sallei* does not occur west of New Orleans LA. LeConte's recording of *sallei* from Texas has caused many subsequent workers and cataloguers to include Texas in the distribution, such as Leng (1920:166), Schenkling (1925:8), and Arnett (1952:106).

All specimens now in the LeConte Collection were discussed in detail and identified by Hayek (1973:262): *sallei* #5 from Florida was identified as *sallei*; *sallei* #2 from New Mexico was identified as

arizonae (now *schottii*). However, because of distributional problems created by two of Hayek's identifications and because of newly discovered morphological characteristics, I have examined two specimens from LeConte's *sallei* series: *sallei* #3, with red paper disk (=Texas), is actually con-specific with the holotype of *schottii* and is not an unknown species as Hayek stated; *sallei* #4, with red paper disk (=Texas), is the new species *hayekae*, as Hayek suggested, though she did not name the species at the time.

What comprised LeConte's series when he described *sallei* is unknown. He might have had all three species, but we do know that he thought his Eagle Pass specimens were *sallei*. Today his collection has all three species standing under the name *sallei*.

Lanelater hayekae Spilman, new species

Agrypnus schottii of authors, not

LeConte: Leng 1920:166. Schenkling 1925:8.

Agrypnus sallei of authors, not LeConte:

Knaus 1928a:20; 1928b:99.

Lanelater schottii of authors, not LeConte:

Arnett 1952:105. Hayek 1973: 263.

Diagnosis. Antenna (fig. 14) of moderate length, slightly longer in male than in female, male with 1 1/2-2 and female with 1/2-1 antennomeres extending beyond posterior border of coxa I; antennomere 3 moderately expanded apically; 4-10 of moderate length, very weakly or not incurved on ventral border; 11 long and very strongly and abruptly narrowed at apical third; 1-3 shiny, 4-11 dull. Pronotum (fig. 4) with lateral marginal carina and supramarginal carina sharp, the latter becoming obsolete at apical 1/3 of pronotal length; posterior corners usually truncate apically, usually not attenuate or slender, never prolonged nor strongly diverging; dorsally with punctures medium-sized, dense, those near lateral borders cribrate. Elytra having stria punctures small and with interconnecting groove on base of lateral striae; interval punctures small. Ventral surfaces with small, very dense punctures and setae laterally. Antennal groove long, usually reaching border of coxal cavity I. Tibia I in cross section (fig. 9) with anterior edge of dorsal surface angled, this angle forming a weak anterior carina on dorsal surface along whole tibia; tibia I broader than in other two species, especially

noticeable in basal half; male with legs slightly longer than in female. Setae of pronotum and elytra whitish or yellowish, moderately long, weakly arched, often recumbent. Male genitalia (fig. 7) having parameres straight, apex oblique, stouter than in *sallei*; basal piece broad; penis stout, with apex in lateral view broad and straight; gonopore broad and with very lightly sclerotized setae. Female genitalia having ovipositor with coxites often with large longitudinal unsclerotized areas laterally, usually shorter and stouter than in *sallei* and equal to those in *schottii*; valvifers shorter than in *sallei* and *schottii*, length of valvifers is 44-45% (average 45%) length of coxite; proctiger not long, apex not extending beyond bases of coxites; sclerotized invaginations of genital chamber obviously unequal in size, one large and one small. Length 17-32 mm.

Distribution. Kansas to southern Texas.

Holotype: male; Medora, Kan., VIII-13-24, W. Knaus; *Agrypnus sallei* Lec., det M. C. Lane; Merton C. Lane Collection 1975; USNM. Allotype: female; Garfield Co., Okla. 1960, coll. John F. Reinert; USNM.

Paratypes: UNITED STATES.

KANSAS. Edwards Co.: Fellsburg 3viii27 C.O.F. 1fKSUC. Reno Co.: Medora 9viii26 W.Benedict 1mCNCI, 13viii24 W.Knaus 1mUSNM, 24viii25 1mUSNM 3mlFUSNM. Riley Co.: Manhattan ix32 1fKSUC.

OKLAHOMA. Jefferson Co.: Ryan vi60 18vii56 V.E.Hayes 2mFSCA. TEXAS. Bexar Co.: 16x32 H.B.Parks 1fTAMU, 24ix36 1fTAMU. Brazos Co.: Bryan 26viii64 J.C.Schaffner 1mTAMU; Cedar Creek 5ix70 Board & Phelps 2fTAMU; College Station 7x62 W.L.Sterling 1fTAMU, 14x45 H.J.Reinhard 1fTAMU, 1mUSNM. Brooks Co.: 6 mi s of Falfurrias 10x70 G.C.Gaumer & R.R.Murray 1fTAMU; Barroso 11vi34 J.N.Knull 1m2fFMNH. Brown Co.: Lake Brownwood State Park 13ix66 A.&M.E.Blanchard 1fEJFC. Cherokee Co.: Jacksonville 19viii 1fTAMU. Colorado Co.: Columbus 24viii 1mUSNM. Comal Co.: 1fUSNM. Cottle Co.: Paducah 8viii67 A.&M.E.Blanchard 1mUSNM; Wildlife Management Area-near Paducah 6ix66 A.Blanchard 1fUSNM. Dallas Co.: no further locality 1935 Richman 1fFMNH. Dimmit Co.: Texas Experiment Station 22vi33 16vii33 16ix33 2m2fTAMU, 6vii34 S.E.Jones 2fTAMU. Frio Co.: Pearsall 30ix36 1mlfTAMU. Kenedy Co.: Armstrong 7viii71 W.H.Tyson 1fCNCI.

Leon Co.: Jewett 23vii47 D.J. & J.N.Knull 1mlfFMNH. Limestone Co.: Mexia 6vii37 1mTAMU. Nueces Co.: Corpus Christi 9vi70 C.W.Griffin 1mTAMU. Refugio Co.: Goose Island State Park 20-23viii62 H.R.Burke 1fTAMU. San Patricio Co.: Welder Wildlife Refuge 27vi69 Board & Hafernik 2mTAMU. Victoria Co.: Victoria 22vi15 J.D.Mitchell, ix 2mUSNM. Willacy Co.: Site B 30xi46 G.B.Vogt 1mGBVC. Williamson Co.: Taylor 1lviii61 J.E.Hafernick 1fTAMU. Wilson Co.: Floresville 9vii55 D.H.Habeck 1mFSCA. County unknown: Padre Island 24vi14 1mUSNM, vii65 4ml5FUSNM.

Literature Records: UNITED STATES. KANSAS. Reno Co.: Medora viii ix (Knaus 1928a:20; 1928b:99, *sallei*; Hayek 1973 1973:263).

OKLAHOMA. Greer Co.: (Hayek 1973:263). TEXAS. Brooks Co.: Falfurrias (Hayek 1973:263).

Biology. Significant data are meager. Tree sap, decayed watermelon, and lights attract this species. Specimens have been collected June through November inclusive, but mostly in August. Biological data from labels and literature can be summarized as follows. Specimens examined: under watermelon, sand dunes, Medora KS; in flight at dusk, sand hills, Site B Willacy Co.TX; at light and at ultra-violet light, various localities OK TX. George B. Vogt has told me in conversation that Site B, Willacy Co. TX, is along State Highway 186 just west of what is now Port Mansfield at the southern end of the King Ranch; the area is the southern end of the moving sand hills. Literature records: feeding on juices of decaying watermelons, hiding under melons, feeding on exudation of sap from broken willow branches, and at light, Medora KS (Knaus 1928a:28; 1928b:99).

Discussion. This species is not new to science. It is a fairly well-known species that has previously been incorrectly identified as *schottii*. Hayek in 1973 pointed out that the name *schottii* must be used for the species, usually called *arizonae*, that occurs from Arizona to Texas, but she did not name this species. Thus, until now this species, occurring from southern Texas to Kansas, has not been formally named. I name it for Christine M. F. von Hayek, whose trenchant work made much of my work possible.

Lanelater schottii (LeConte)

- Agrypnus schottii* LeConte 1853:492.
Candèze 1857:45. Lacordaire 1857:139.
Stroud 1950:667.
- Agrypnus arizonae* Candèze 1896:5. Leng
1920:166. Schenkling 1925:8. NEW
SYNONYMY.
- Lanelater arizonae*: Arnett 1952:106.
Hayek 1973:243.
- Lanelater schottii*: Arnett 1962:figs.
2-46.
- Lanelater* sp.: Hayek 1973:263.

Diagnosis. Antenna (fig. 15) of moderate length, slightly longer in male than in female, male with 1-2 and female with 0-1/2 antennomeres extending beyond posterior border of procoxa; antennomere 3 moderately expanded apically; 4-10 of moderate length, very weakly or not incurved on ventral border; 11 long and very strongly and abruptly narrowed at apical third; 1-3 shiny, 4-11 dull. Pronotum (fig. 5) with lateral marginal carina sharp in basal half, becoming dull in apical half, supra-marginal carina dull, becoming obsolete at half pronotal length; posterior corners truncate, not slender, not prolonged so far posteriorly as in other species, only moderately diverging but often slightly incurved apically; dorsally with punctures large, dense, cribrate. Elytra with punctures of striae larger than in other two species, especially so in lateral striae, with broad distinct interconnecting groove in lateral striae; interval punctures small. Ventral surfaces with large, moderately dense punctures and setae laterally, smaller punctures medially. Antennal groove long, usually not reaching border of coxal cavity I. Tibia I in cross section (fig. 10) with anterior edge of dorsal surface rounded, dorsal surface therefore rounded along whole tibia; tibia I narrower than in *hayekae*, narrowed to base; male with legs slightly longer than in female. Setae of pronotum and elytra whitish, slightly shorter than in other species, usually strongly arched, especially those on lateral areas. Male genitalia (fig. 8) having parameres strongly curved laterally, apex almost truncate; basal piece broad; penis in dorsal view stout, with apex in lateral view broad and straight; gonopore broad and with very lightly sclerotized setae. Female genitalia having ovipositor with coxites often with large longitudinal unsclerotized areas laterally, usually shorter and stouter than in *sallei* and equal to those in *hayekae*; valvifers

usually shorter than in *sallei* and longer than in *hayekae*, length of valvifer is 55-78% (average 63%) length of coxite; proctiger not long, apex not extending beyond bases of coxites; sclerotized invaginations of genital chamber equal in size, both small. Length 14-26 mm.

Distribution. Southern Arizona, New Mexico, western Texas, across the border into Chihuahua and Coahuila, thence eastward and southward into the Rio Grande River area of southern Texas as far as Starr County.

Specimens Examined.

MEXICO.

CHIHUAHUA. Highway 45, 5 mi w of Jimenez 22vi67 1?67.

COAHUILA. Boquillas del Carmen 1800 ft 23v59 3mCNCI.

UNITED STATES.

ARIZONA. Cochise Co.: Benson 24vi46 1mCASC; Chiricahua Mts. 7vii61 1mFMNH; Portal 15-16vii66 2?CNCI, vii64 1fUSNM; Willcox 11vi54 28vi56 2?FMNH, 8-10vii78 1mCNCI, 1viii71 1mLFUSNM, 1000 ft 8-10vii78 6?CNCI, 4200 ft 24vii70 1mUSNM; Willcox Playa 24v70 24vii74 6m2FCNCI, 24vii70 1mLFUSNM; Gila Co.: Globe vii 2mCNCI 1mUSNM, 1vii31 1mAMNH 7?FMNH, vii7viii 2mCASC, 10-26vii78 1?CNCI, 20vii33 2mCASC; Cutter 17vii49 1mCNCI; Pinal Mts. vii30 4mCNCI; base of Pinal Mts. 11viii25 1?CNCI. Maricopa Co.: Phoenix 22vi50 1mCNCI; Tempe 20viii17 1mUSNM; Wickenburg 13vi 26viii 2?FMNH, 7vii58 1?CNCI. Pima Co.: Continental vi73 1mUSNM; Coyote Mt. vi73 1fUSNM, vii73 1mUSNM; Florida Canyon vi69 4mUSNM; Green Valley v69 4mUSNM, vi69 6mUSNM, vi73 1mUSNM; between Gunsight & Covered Wells 12vii50 1mCASC; Madera Canyon vi73 1mUSNM; Pima Canyon 27vi80 1?CNCI; Sabino Canyon 29v20 1mUSNM, 24,29v19 2mUSNM, 5vii53 1fUSNM, 8vi55 1mFMNH, 29v20 4?FMNH, 22vi19 1mCNCI 1mUSNM, 8v18 1mCASC, 6vi52 1fAMNH, 3000ft 11vi50 1mAMNH, 26vi33 1mCASC; Santa Catalina Mts. 26vi33 1mCASC; Santa Rita Ranch vii74 1m; Tucson 16vi35 vi64 7vii71 8vii32 12vii33 20vi32 8vii39 5viii35 10mUSNM, 7vii70 1mLFUSNM, 17-18vii57 3?CNCI, 25vi36 1vii35 20vii33 13vii37 26viii35 6mCASC, 20vii33 1mLFASC, 7vii30 1mCASC, 10viii39 1mUSNM, 12x34 1vi36 2mUSNM, 22vi35 1mCASC 1mUSNM, 4vi 1mFMNH, 15vii13 2?FMNH, 2400ft 27vi50 1mAMNH, 3000ft 25vi50 1mAMNH.

NEW MEXICO. Bernalillo Co.: Albuquerque 1mAMNH, 14vii18 1mCASC. Dona Ana Co.:

lvi38 lmUSNM; Las Cruces 24vi29 lmFMNH; Jornada Experimental Range 15ix71 lfUSNM. Eddy Co.: Carlsbad 29-30v79 lmTAMU; 11.7 mi sw junction highways 137 & 285 lvi79 lFTAMU; 32°20.3'N 103°50'W (Site 10) 30v79 lFTAMU; 32°23'N 103°51.4'W (Site 5) 30v79 lmTAMU. Hidalgo Co.: Doyle Well S.23 T29S R14W 3vii77 lmCNCI; Rodeo 19v48 lmUSNM. Lincoln Co.: La Luz 27vii47 2?FMNH.

TEXAS. Brewster Co.: Lajitas 19v59 2mCNCI; (the following are within Big Bend National Park) Boquillas 1850ft 13,17,23,25,28,29v59 12mlFCNCI; Boquillas Canyon 4vii72 2mlFFMNH; Castolon lvi28 lmTAMU; 2 mi w of Castolon 2150ft 14v59 lmCNCI; 5 mi n of Glenn Spring 3000ft 24v59 6mCNCI; Hot Springs 1900ft 6v59 lmCNCI; Santa Elena Canyon 4iv69 1?FMNH. Culberson Co.: Van Horn lviii47 lmUSNM lmFMNH. El Paso Co.: El Paso 26v64 lmUSNM, 28vi21 lmCASC; Fabens 20vi53 1?CNCI. Hudspeth Co.: Sierra Blanca 5vi50 1?CNCI. Kinney Co.: Brackettville i25v77 1fEJFC. LaSalle Co.: Cotulla 8iv08 lfUSNM, 2v17 lfUSNM. Presidio Co.: Presidio 5,14,17vi68 16vii68 6mTAMU; 3 mi n of Presidio 2viii68 lmTAMU; 3 mi se of Presidio 4vi68 2fTAMU; Alamito Creek 5 mi se of Presidio 5vi68 lmTAMU. Starr Co.: 5 mi n of Rio Grande City 1,2vi54 2fCNCI; Site K 14vi47 5vii47 10m9fGBVC; no further locality 25v51 DJ&JNKnull 1fFMNH. Terrell Co.: Sanderson 18v37 lmCASC. Webb Co.: Laredo 24vii lfUSNM.

Literature Records.

UNITED STATES.

ARIZONA. (Leng 1920:166; Schenkling 1925:8). Pima Co.: Tucson (Candèze 1896:5). Pinal Co.: Globe (Hayek 1973:243).

NEW MEXICO. (Lacordaire 1857:139). Lincoln Co.: Malpais w of Carrizozo. Otero Co.: 2 mi n of La Luz (Stroud 1950:667). Socorro Co.: Bernardo viii78 fUSNM.

TEXAS. County unknown: lower Rio Grande River (LeConte 1853:492; Candèze 1857:45).

Biology. Significant data are meager. On the ground, under objects, and at lights are the usual associations. Specimens have been collected in every month from April through October inclusive, but mostly May through July. Biological data from labels and literature can be summarized as follows. Specimens examined: under cactus and under *Opuntia*, Cotulla TX; in pitfall

trap, Site 5 NM; at light and at black light, various localities AZ NM. In addition, numerous specimens were collected at Site K, Starr Co. TX, beaten from under trunks of *Yucca treculiana* Carr. cut 16 and 17 months earlier and resting on sandy soil; this vegetation area was briefly described and indicated as Locality #22 on a map (Vogt 1949:194, fig. 1); Vogt has told me in conversation that Site K is 6-7 miles north of Roma. Literature records: in molasses traps left overnight, 2 mi north of La Luz and Malpais west of Carrizozo NM (Stroud 1950:667).

Discussion. This species has been known as *arizonae*; most previously identified specimens have that name attached. Hayek (1973) pointed out the probable synonymy of *schottii* and *arizonae*, and identified specimens of this species as *schottii*. She, as I, examined the type of *schottii* but not the type of *arizonae*. The original description of *arizonae* was based on a specimen from Tucson AZ and that of *schottii* on a specimen from the lower Rio Grande River TX. Because I have studied a long series of specimens from southern Texas, western Texas, Mexico, New Mexico, and southern Arizona--all agreeing with the type of *schottii*--and because only one species of this genus occurs at Tucson, I believe there can be no doubt that *arizonae* and *schottii* are the same species. I have therefore taken the positive step of creating this new synonymy, only previously suspected. This is done to eliminate confusion between the two species in Texas. In summary, most specimens of this species, except specimens studied by Hayek, were identified as *arizonae*, and most specimens identified as *schottii* belong to a species now named *hayekae*.

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