

A Taxonomic Revision of the Genus *Stator* (Coleoptera: Bruchidae)¹

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ABSTRACT

Except for designating *Bruchus pruininus* Horn as its type-species, Bridwell did not indicate what bruchid species should be assigned to his genus *Stator*. This genus is now found to include also *Bruchus limbatus* Horn, *B. sordidus* Horn, *B. subaeneus* Schaeffer, *B.*

pythonicus Pic, and *Stator beali*, a new species from Texas. These six species are keyed; each is described, its male genitalia are figured, and its distribution is given. The known range of the genus is from Texas to California (and Hawaii), and south into Mexico.

By 1905 some 60 Nearctic species had been described in the genus *Bruchus*. Schilsky (1905), noting the bulkiness of the genus, divided it and removed some of its species to his new genera *Acanthoscelides*, *Bruchidius*, and *Bruchinus*. Neither Schaeffer (1907) nor Fall (1910) recognized these genera when they added about 25 new species, bringing the total number of Nearctic species of *Bruchus* to about 85.

Bridwell (1946) realized the need for further division of the genus *Bruchus* and for further definition of other Nearctic bruchid genera. He set the limits of *Bruchus* to include only Old World species, erected 12 new genera, and so defined *Acanthoscelides* that it contains more species than any other Nearctic genus of the family. Bridwell designated a type-species for each new genus, but did not indicate what other species should be included either in these or in the older genera of Schilsky. The purpose of the present paper is to treat the species that I believe should be placed in the genus *Stator* Bridwell.

Horn (1873), in his revision of the Nearctic Bruchidae, used the armature of the hind femora, among other characters, to divide the species of *Bruchus* into several groups. Among the new species that he described were three that are here assigned to *Stator*. Of these, *Bruchus sordidus*, together with two Fabrician species, was placed by Horn in his Group III, while *B. limbatus* and *B. pruininus*, along with five other new species, were assigned to his Group V.

Schaeffer (1907), taking into account the variation in size and number of the femoral teeth and the similarity between *sordidus*, *pruininus*, and *limbatus*, suggested placing *sordidus* with the other two; he also included a new species, *Bruchus subaeneus*, which, he indicated, was very similar to *sordidus*. Fall (1910) modified Horn's Group V to include the aforementioned four species, *Bruchus pygidialis* Schaeffer (= *pythonicus* Pic), and eight other species.

The genus *Stator*, in my opinion, includes the five species named above and a sixth species here described as new. Its geographical range, as known at present, extends from Texas westward to central California (and Hawaii) and southward into Mexico.

I have found consistent taxonomic characters for separating the species in the structure of the male genitalia. Female genitalic structures were examined

also, but proved less useful than those of the males for differentiating species. Two parts of the male genitalia were of especial value. One was the shape of the tip of the aedeagus, an elongate, usually sharply pointed structure lying on the forked parameres. The second was the internal sac, which contains various sclerotized teeth and/or other structures, and is pictured at the bottom of each drawing. The internal sac is everted into the vagina of the female during copulation, and the teeth, barbs, and other structures in the walls of the sac apparently serve to hold the two individuals together during coitus.

ACKNOWLEDGMENTS

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Genus *Stator* Bridwell

Stator Bridwell, 1946, Jour. Washington Acad. Sci. 36(2): 55; Bradley, 1947, Psyche, 1946, 53(3-4): 39.

Adult Male.—Front usually with a median glabrous line and usually with median low carina. Pronotum with flanks separated from dorsum by a simple, gently curved, lateral carina extending from posterior angle of pronotum and ending near coxal cavity; carina smooth, without denticles. Fifth and sixth elytral striae abbreviated at apex, about four-fifths as long as fourth; no basal elytral denticles. Hind femur with both ventral margins carinate, outer margin more prominent; a single, strong tooth on inner ventral margin. Mucro at apex of hind tibia one-fourth as long as first tarsal segment. Apex of last abdominal sternum emarginate.

Adult Female.—Apex of last abdominal sternum in gentle curve toward posterior, not emarginate.

Type of the genus.—*Bruchus pruininus*² Horn, by original designation.

Stator is a distinct genus with well-defined limits.

¹ Accepted for publication November 5, 1962.

² Misspelled *pruinus* in Zoological Record for 1946, Insecta, p. 264.

The presence of a lateral pronotal carina bearing no denticles serves to distinguish this from any other North American bruchid genus. *Stator* somewhat resembles *Sennius* Bridwell but is quite easily distinguished as the latter lacks the lateral carina on the pronotum.

KEY TO THE SPECIES OF *Stator*

1. Elytra rufous with lateral, basal, and sutural margins fuscopiceous to black..... 2
Elytra fuscous to piceous, without rufous spots..... 3
2. First segment of hind tarsus rufous; apex of hind tibia usually rufous; apex of hind femur sometimes rufous; body covered with sparse yellow pubescence..... *beali*, new species
All segments of hind leg black; body covered with sparse white pubescence..... *limbatus* (Horn)
3. Apex of hind femur with some rufous coloration..... *sordidus* (Horn)
Hind femur black..... 4
4. Pubescence white, giving dusty appearance to body; eyes prominent, posterior portions protruding from adjacent surfaces; antennae with some piceous coloration..... 5
Pubescence mixed, white and fusc ferruginous; eyes flattened, posterior portions slightly more prominent than adjacent surfaces; antennae rufous..... *subaeneus* (Schaeffer)
5. Base of pygidium with two or three dots of white pubescence..... *pythonicus* (Pic)
Pygidium with uniform, sparse, white pubescence, without basal white dots..... *pruininus* (Horn)

Stator limbatus (Horn), new combination

Bruchus limbatus Horn, 1873, Trans. Amer. Entomol. Soc. 4: 324 (in key), 326; Schaeffer, 1907, Mus. Brooklyn Inst. Sci. Bull. 1(10): 292; Fall, 1910, Trans. Amer. Entomol. Soc. 36: 165.

Acanthoscelides limbatus: Blackwelder, 1946, Bull. U. S. Natl. Mus. 185(4): 760.

Adult Male.—Head black, with sparse white pubescence. Antenna with basal four to five segments rufous, apical six or seven segments fuscous to black; basal four segments filiform, apical seven segments subserrate; basal segment two times longer than second segment. Eyes prominent, their posterior portion protruding from surrounding surfaces. Pronotum black, with sparse white pubescence. Scutellum usually quadrate, sometimes transverse, with sparse white pubescence. Elytron rufous, with lateral, basal, and sutural margins black; lateral black margin usually ending with maculation produced subapically as far as seventh stria; elytron glabrous or with very sparse white pubescence. Pygidium black, with uniform white pubescence. Venter black with white pubescence. Prothoracic and mesothoracic legs rufous, metathoracic leg black. Last abdominal sternum no longer than preceding sternum, emarginate. Genitalia with apex of aedeagus acuminate; internal sac with two large, gently curved teeth, one of which has many denticles (Fig. 2). Length, pronotum-elytra, 2.1 to 2.6 mm.

Adult Female.—Last abdominal sternum as long as combined length of the two preceding sterna. Length, pronotum-elytra, 1.8 to 2.6 mm.

Reared from seeds of *Cercidium floridum* Bentham and *Acacia greggi* Gray.

Location of type: Academy of Natural Sciences, Philadelphia.

Specimens examined: 144, from the following localities. ARIZONA.—*Pima*:³ Baboquivari Mts.; Tucson. *Pinal*: 5 mi. N. Casa Grande; Florence Jct.; 11 mi. S. Florence; 2 mi. E. Oracle. *Maricopa*: 5 mi. W. Buckeye; Chandler; Gila Bend; 3 mi. S. Gila Bend; Granite Reef Dam; 18 mi. E. Mesa; Palo Verde; Peoria; 10 mi. N. Scottsdale; 9 mi. S. Sunflower. *Cochise*: Benson; Carr Cn., Huachuca Mts.; Chiricahua Mts. *Gila*: Apache Lake. *Santa Cruz*: Nogales. CALIFORNIA.—*Imperial*: Palo Verde. *San Diego*: (without definite locality). *Riverside*: 9 mi. N. Blythe; 19 mi. W. Blythe; Indio. *Los Angeles*: Camp Baldy; Pasadena; Pomona; Tanbark Flat; Santa Monica; Avalon, Santa Catalina Isl. *Santa Barbara*: Santa Barbara. *San Bernardino*: 34 mi. S. Needles. *Lake*: Lucerne. TEXAS.—*Brewster*: Alpine. *Uvalde*: Uvalde. *Bexar*: Leon Creek. *Webb*: Laredo. MEXICO.—*Baja California*: San Antonio, Terr. Sur.; 15 mi. S. San Domingo; Ruffo Ranch; Isla Cerralbo. *Sonora*: San Carlos Bay. HAWAII.—Puu Lanipo, Koolau Range, Oahu.

Stator limbatus is recognized by the rufous elytra with black margins, in combination with the black metathoracic leg. Male genitalic differences are treated in the discussion of *S. beali*.

Stator beali, new species

Adult Male (Holotype).—Head black, with sparse yellow pubescence; front with median glabrous line; labrum fuscous. Antenna rufous; four basal segments filiform, apical seven subserrate. Eyes prominent, posterior portions protruding from adjacent surfaces. Pronotum black, with sparse yellow pubescence. Scutellum quadrate, black, with white pubescence. Elytron rufous, with lateral, basal, and sutural margins fuscopiceous; lateral margin ending with subapical fuscopiceous maculation produced medially to sixth stria; elytron with sparse yellow pubescence. Pygidium black, with three faint, basal, white-pubescent dots, one medial, two lateral; remainder uniformly white-pubescent. Venter black, with mixed yellow and white pubescence. Prothoracic and mesothoracic legs rufous; hind femur black with fuscous apex, tibia and tarsus fuscous. Last abdominal sternum no longer than preceding sternum. Length, pronotum-elytra, 2.6 mm.

Range of Observed Variations.—Front with median glabrous line or carina; labrum rufous to fuscous. Six apical antennal segments rufous to fuscous. Lateral piceous maculation of elytron sometimes produced medially to fifth stria. Lateral white-pubescent dots on base of pygidium sometimes prolonged into lines reaching almost to apex. Venter sometimes with all yellow pubescence. Hind femur usually

³ Names in italics are those of counties, if in the United States. Names of Mexican states also are italicized in the locality lists under the various species.

piceous, rarely with rufous apex; apex of hind tibia usually rufous to fuscous; first segment of hind tarsus always rufous to fuscous. Genitalia (Fig. 4) with apex of aedeagus acuminate; internal sac with two large, simple teeth which lack denticles. Length, pronotum-elytra, 2.4 to 2.7 mm.

Adult Female.—Subapical projection from lateral marginal line of elytron reaching at least to sixth stria, sometimes forming a band across elytron. Last abdominal sternum longer than preceding sternum. Length, pronotum-elytra, 2.4 to 2.8 mm.

Types.—Holotype male, allotype female, and numerous paratypes reared from seeds of *Siderocarpus flexicaulus* from Brownsville, Cameron County, Texas, June 1921 (J. C. Bridwell). Holotype, allotype, and paratypes deposited in the U. S. National Museum. Other paratypes from the following localities: TEXAS.—Cameron: Brownsville, Dec. 23, 1939, 1 ♀ (No. 36981), March 6, 1911, 2 ♀ (M. M. High); May 13, 1 ♂, May 18, 2 ♀, and May 28, 1904, 2 ♂, 1 ♀ (H. S. Barber); Nov. 20, 1907, 1 ♂, 3 ♀ (J. D. Mitchell); Nov. 18, 1937, 1 ♂ (No. 26742); Jan. 15, 1932, 1 ♂ (S. W. Frost); March 11, 1938, 1 ♂ (No. 22731). Hidalgo: Hidalgo, Jan. 23, 1939, 1 ♂ (collector unknown); Pharr, Jan. 27, 1944, 2 ♂, 1 ♀ (No. 5219). Kleberg: Kingsville, 1921, 1 ♀ (J. C. Bridwell). Sutton: Sonora, April 12, 1938, 1 ♂, 5 ♀ (No. 057872). "Mexican Border," May 12, 1938, 1 ♂ (Thayer 2010), Feb. 14, 1939, 2 ♂, 1 ♀ (Thayer 2015), March 2, 1939, 1 ♂ (Thayer 2011).

This species is named for Dr. Richard S. Beal, Jr., now of Flagstaff, Arizona, who has given me invaluable assistance in my study of the biosystematics of the Bruchidae.

Stator beali most closely resembles *S. limbatus*, from which it can be distinguished by the rufous coloration of the hind leg. The subapical projection of the lateral dark elytral margin usually projects to the sixth stria in *beali*, a lesser distance in *limbatus*. Male genitalic differences can be noted by comparing Figs. 2 and 4. *S. limbatus* has two teeth in the internal sac, one simple and elongate, the other curved and with many denticles. *S. beali* has two larger, pointed teeth in the internal sac.

Stator pruininus (Horn)

Bruchus pruininus Horn, 1873, Trans. Amer. Entomol. Soc. 4: 324 (in key) and 327; Schaeffer, 1907, Mus. Brooklyn Inst. Sci. Bull. 1(10): 292; Fall, 1910, Trans. Amer. Entomol. Soc. 36: 166.

Bruchidius pruininus: Herford, 1935, Trans. Soc. British Entomol. 2: 17.

Acanthosclides pruininus: Blackwelder, 1946, Bull. U. S. Natl. Mus. 185(4): 760.

Stator pruininus: Bridwell, Jour. Washington Acad. Sci. 36(2): 55; Bradley, 1947, Psyche (1946) 53: 39.

Adult Male.—Over-all appearance pruinose from coarse, white pubescence over black ground color. Basal three or four antennal segments rufous, others black; basal four segments filiform, others subserrate; third segment two times length of fourth. Eyes prominent, posterior portions protruding from ad-

jacent surfaces. Scutellum quadrate, covered with dense, white pubescence. Elytron black, with white pubescence. Pygidium black, with uniform white pubescence. Venter black, with white pubescence. Prothoracic and mesothoracic legs varying from entirely rufous to fuscous with sparse rufous mottling; metathoracic legs all black. Last abdominal sternum emarginate, not so long as combined length of two preceding sterna. Genitalia (Fig. 1) with apex of aedeagus obtusely rounded; internal sac with one large tooth and 10 or more smaller teeth. Length, pronotum-elytra, 1.5 to 2.4 mm.

Adult Female.—Last abdominal sternum as long as or longer than combined length of two preceding sterna. Length, pronotum-elytra, 1.5 to 2.4 mm.

Reared from seeds of *Olearya tesota* Gray, *Robinia pseudo-acacia* L., and *Acacia constricta* Benth.

Location of type: Academy of Natural Sciences, Philadelphia.

Specimens examined: 326, from the following localities. ARIZONA.—Pima: Alamo Cn., Ajo Mts.; Bear Wallow, Mt. Lemmon; Continental; Hk. mi. 5, Catalina Mts.; Hk. Hy. mi. 2, Catalina Mts.; Molino Camp, Sta. Catalina Mts.; Sahuarita; San Vicente; Santa Catalina Mts.; Tucson. Pinal: Coolidge; Eloy. Maricopa: Higley; Peoria; Phoenix; Sacaton; Tempe. Cochise: Bar Foot Ridge, Chiricahua Mts.; Bowie; Carr Cn., Huachuca Mts.; 6 mi. E. Douglas; Dry Cn., Sands Ranch, S.E. end Whetstone Mts.; Elfrida; Flys Peal, Chiricahua Mts.; Gleeson; 5 mi. W. Gleeson; 10 mi. N. Pearce; Ramsey Cn., Huachuca Mts.; St. David; Tombstone Cn., Mule Mts.; E. Tombstone. Gila: Claypool; Globe; 20 mi. N. Globe; 30 mi. N. Globe; Miami; Pinal Mts. Santa Cruz: Amado; Nogales; Tubac. Yuma: 30 mi. E. Ehrenberg; 5 mi. W. Salome; 15 mi. E. Quartzite. Graham: Duncan; Geronimo; Graham Mts.; Safford. Navajo: Joseph City. Yavapai: Prescott; Bumble Bee. CALIFORNIA.—San Diego: Balboa Park. Riverside: Riverside. Los Angeles: Pasadena; San Pedro. San Luis Obispo: Paso Robles. Tulare: Porterville. Fresno: Fresno. Mariposa: Coulterville. San Mateo: Redwood City; Montara. San Francisco: San Francisco. Contra Costa: Danville; Martinez; Vine Hill. Alameda: Oakland. Calaveras: Mokelumne Hill. Sacramento: Sacramento. TEXAS.—Brewster: 20 mi. S. Alpine; Chisos Mts. Jeff Davis: 2 mi. W. Fort Davis. Valverde: Del Rio; Devils River near Del Rio. Uvalde: Uvalde. Terrell: Sanderson; Dryden. Webb: Laredo. Starr: Roma. MEXICO (Gulf of California).—Isla Partida; Isla Espiritu Santo; San Esteban I.; San Francisco I.; Palm Cn., Angel de la Guardia Isl. HAWAII: Honolulu; Koko Head Region, Oahu.

Stator pruininus is recognized by the pruinose appearance of its body and the black metathoracic legs. Male genitalic structures are shown in Fig. 1. The primary genitalic difference between *pruininus* and other species of *Stator* is the presence of 20 or more large, sclerotized teeth in the internal sac and the obtusely rounded aedeagal tip.

Stator sordidus (Horn), new combination

Bruchus sordidus Horn, 1873, Trans. Amer. Entomol. Soc. 4: 317 (in key) and 319; Schaeffer, 1907, Mus. Brooklyn Inst. Sci. Bull. 1(10): 292-4; Fall, 1910, Trans. Amer. Entomol. Soc. 36: 166.

Acanthoscelides sordidus: Blackwelder, 1946, Bull. U. S. Natl. Mus. 185(4): 761.

Adult Male.—Over-all color fuscous to fuscopiceous, covered with white to fuscoferruginous pubescence. Basal four antennal segments rufous, filiform, apical seven segments fuscous (the last may be rufous), subserrate. Eyes prominent, posterior portions protruding from adjacent surfaces. Scutellum transverse, with white pubescence. Pygidium with two or three basal, white- to fuscoferruginous-pubescent dots. Pro- and mesothoracic legs rufous. Tibia and tarsus, and apex of femur, of metathoracic legs rufous, base of femur fuscopiceous; outer edge beneath femur with a small tooth before the emargination. Last abdominal sternum emarginate, not as long

as combined length of two preceding sterna. Genitalia (Fig. 3) with apex of aedeagus obtusely rounded; internal sac with one large tooth with basal fork. Length, pronotum-elytra, 1.7 to 2.6 mm.

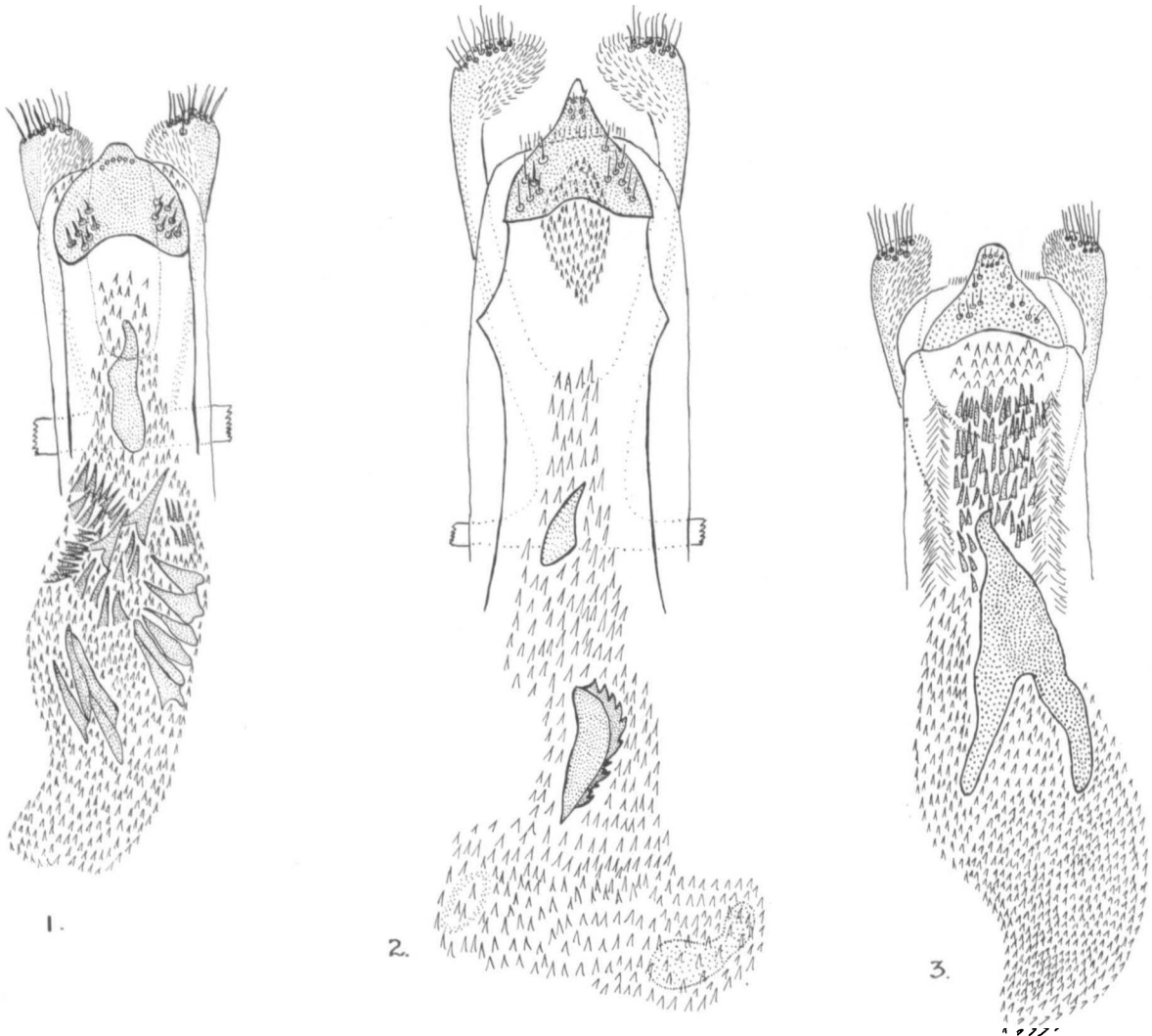
Adult Female.—Last abdominal sternum as long as or longer than preceding sternum. Length, pronotum-elytra, 1.8 to 2.4 mm.

Host plants: Unknown.

Location of type: Academy of Natural Sciences, Philadelphia.

Specimens examined: 22, from the following localities. ARIZONA.—*Cochise*: Ramsey Cn., Huachuca Mts. *Gila*: 30 mi. N. Globe. *Graham*: Safford. *Maricopa*: 9 mi. E. Mesa; Queen Creek. *Pima*: Molino Camp, Sta. Catalina Mts.; Tucson; Hk. mi. 5, Catalina Mts.; 10 mi. E. Tucson. *Santa Cruz*: Madera Canyon, 5500'. TEXAS.—*Cameron*: Brownsville.

Stator sordidus is recognized by the two or three white dots at the base of the pygidium, the rufous



FIGS. 1-3.—Male genitalia of *Stator* species. FIG. 1.—*S. pruinus*. FIG. 2.—*S. limbatus*. FIG. 3.—*S. sordidus*.

coloration on the apex of the hind femur, and the fuscous to fuscopiceous body color which gives it a "sordid" appearance. Male genitalic structures indicate the differences between this species and any other. Fig. 3 shows the obtusely rounded aedeagal apex and the single large tooth with a basal fork in the internal sac.

Stator pythonicus (Pic), new combination

Bruchus pygidialis Schaeffer, 1907, Mus. Brooklyn Inst. Sci. Bull. 1(10): 297 (not *pygidialis* Motschulsky, 1874, or *pygidialis* Suffrian, 1870); Fall, 1910, Trans. Amer. Entomol. Soc. 36: 166.

Bruchus pythonicus Pic, 1913, Col. Cat. 55: 43.

Adult Male.—Over-all color fuscopiceous to piceous, covered with white and fuscoferruginous pubescence. Basal four antennal segments rufous, filiform; apical seven segments fuscous to piceous, subserrate. Eyes prominent, posterior portions protruding from adjacent surfaces. Scutellum quadrate, with white pubescence. Pygidium with three basal, white, pubescent dots, one medial, two lateral; remainder sparsely white-pubescent. Pro- and mesothoracic legs rufous

to piceous at base, rufous at apex, tarsi rufous. Hind femur piceous, hind tibia rufous to piceous, hind tarsus fuscorufous to fuscous. Last abdominal sternum emarginate. Genitalia (Fig. 5) with apex of aedeagus subemarginate, not acuminate; internal sac with one large tooth with a basal fork. Length, pronotum-elytra, 2.5 to 2.6 mm.

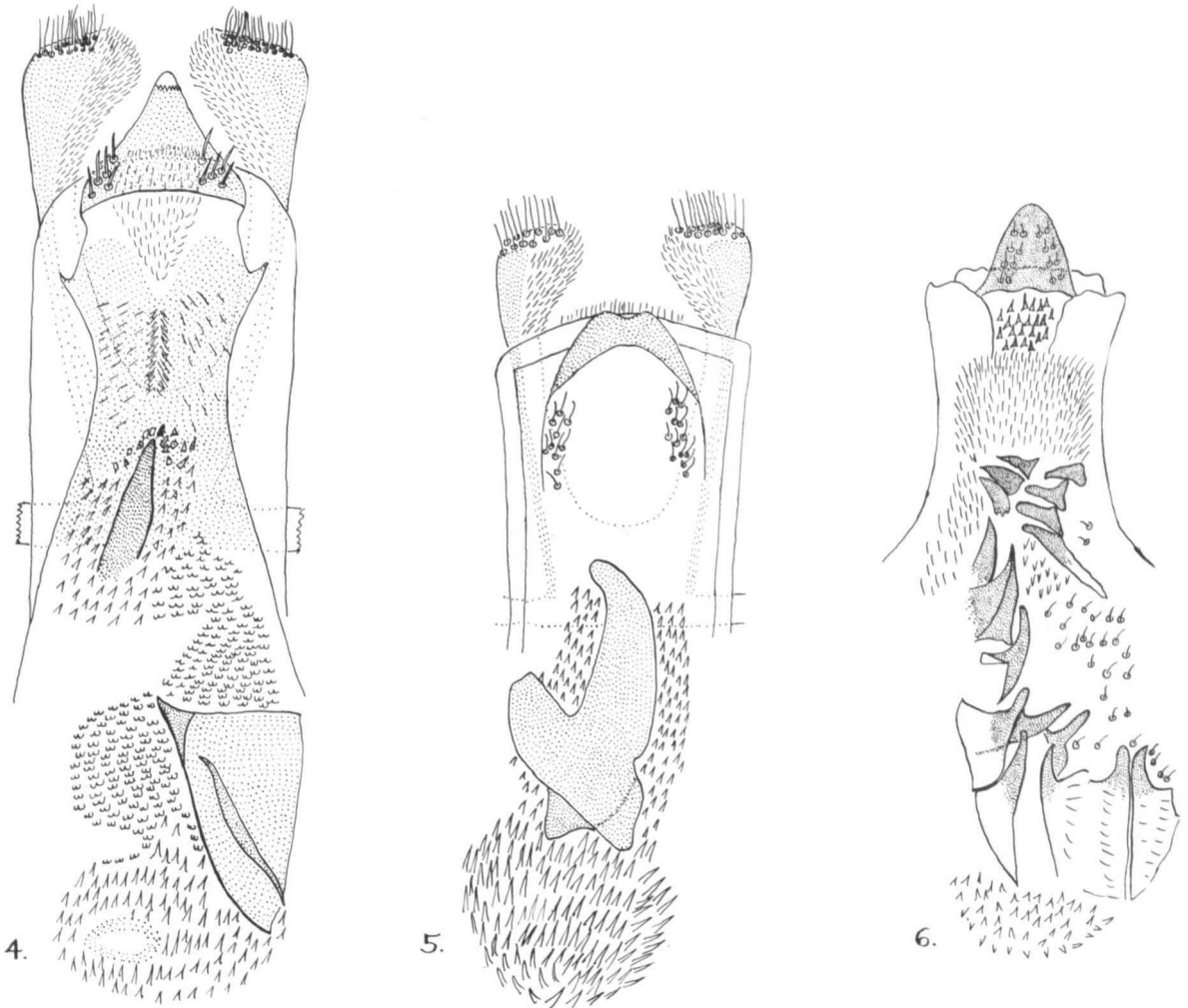
Adult Female.—Pygidium with two lateral, basal, white-pubescent dots. Last abdominal sternum as long as combined length of two preceding sterna. Length, pronotum-elytra, 2.5 to 2.6 mm.

Host plants: Unknown.

Location of type: U. S. National Museum.

Specimens examined: 10, from the following localities. ARIZONA.—*Cochise*: Gleeson; Huachuca Mts. *Gila*: Sierra Ancha Mts. *Santa Cruz*: 20 mi. E. Sonoita. *Yavapai*: Prescott. NEW MEXICO.—*San Miguel*: Las Vegas Hot Springs.

Stator pythonicus is distinguished from other members of the genus by the piceous hind femur with usually rufous to fuscorufous hind tibia and tarsus, the mixed white and fuscoferruginous body pubes-



FIGS. 4-6.—Male genitalia of *Stator* species. FIG. 4.—*S. beali*. FIG. 5.—*S. pythonicus*. FIG. 6.—*S. subaeneus*.

cence, and the two or three white dots at the base of the pygidium. All the males examined had three such dots, the females only two. Whether this is a valid sexual difference will be determined when more specimens are available for examination.

***Stator subaeneus* (Schaeffer), new combination**

Bruchus subaeneus Schaeffer, 1907, Mus. Brooklyn Inst. Sci. Bull. 1(10): 298; Fall, 1910, Trans. Amer. Entomol. Soc. 36: 164.

Adult Male.—Head fuscous to black, with sparse white and fuscoferruginous pubescence. Antenna rufous; basal four segments filiform, apical seven subserrate. Eyes flattened, posterior portions hardly more prominent than surrounding surfaces. Pronotum and elytron fuscous to black, with mixed white and ferruginous pubescence. Scutellum transverse, with dense white pubescence. Pygidium black, with three faint, basal, white-pubescent dots; pubescence at middle and apex mixed white and ferruginous. Venter black, with white pubescence. Pro- and mesothoracic legs rufous. Hind femur black, tibia and tarsus fuscous to fuscopiceous. Last abdominal sternum emarginate. Genitalia (Fig. 6) with apex of aedeagus gently rounded; internal sac with about 18 small teeth. Length, pronotum-elytra, 2.4 to 2.5 mm.

Adult Female.—Basal white dots of pygidium more pronounced than in male. Last abdominal sternum as long as or longer than preceding sternum. Length, pronotum-elytra, 2.4 to 2.5 mm.

Host plant: Unknown.

Location of type: U. S. National Museum.

Specimens examined: 7, from the following localities. TEXAS.—*Cameron*: Brownsville. MEXICO.—*Tamaulipas*: near Brownsville. *Veracruz*: Tampico.

Stator subaeneus is easily confused with *S. sordidus*, but can be distinguished by its entirely black hind femora and its flattened eyes, the hind femora of *sordidus* having some rufous coloration and the eyes of the latter species being prominent and protruding. The male genitalia of *subaeneus* are shown in Fig. 6. The parameres of the three available male specimens were lost in the dissection.

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Life History of *Lygus hesperus* (Hemiptera: Miridae) in the Laboratory¹

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ABSTRACT

The life history of *Lygus hesperus* Knight was investigated in a laboratory maintained at 80° ± 2° F., with a 15-hour light day. Bean pods served as food and oviposition hosts. Shell vials were used as rearing cages in which bugs were confined individually. Average durations of the life stages were: egg, 7.1 days for both sexes; total nymphal, males 13.2 days, females 13.8

days; adult, males 35.2 days, females 43.4 days. The sex ratio was 113 males to 100 females. Females averaged 9.6 pre-oviposition and 32.2 egg-laying days, and deposited an average of 202.4 eggs per female (maximum, 448 eggs). Under the experimental conditions oviposition and eclosion occurred throughout the 24-hour day.

The life history, some habits, and descriptions of the stages of *Lygus hesperus* Knight have been reported in detail by Shull (1933) and by Sorenson (1939), who conducted their studies under field conditions. This study was undertaken in the laboratory to provide more complete details on the develop-

ment, fecundity, longevity, and habits of *L. hesperus* under controlled temperature conditions.

METHODS AND MATERIALS

The investigation was conducted in a laboratory maintained at 80° ± 2° F., with light provided by overhead banks of fluorescent lamps for 15 hours each day. Three types of cages were used: (1) ¾-

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