

NOTES ON *EDROTES*, *LEICHENUM*, *PALORUS*, *EUPSOPHULUS*, *ADELIMUM*, AND *STRONGYLUM* (*TENEBRIONIDAE*)

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NEW LOCALITY RECORDS FOR *Edrotes arens* LaRivers

Edrotes (*Odrotes*) *arens* LaRivers (1947:320) was described from three individuals collected at the Yuma sand dunes, Yuma Co., Arizona. This odd species has since been collected in numbers (more than thirty being in the University of California Collection) from these places in California—*Riverside Co.*: Hopkins Well; *San Diego Co.*: Borego. The Californian specimens exhibit quite a range in size: length 5.2 to 8.5 mm.; width 3.7 to 5.8 mm. In the collection of J. N. Knull, of Ohio State University, I have seen three specimens from Mexico—*Baja California*: 60 miles south of Mexicali, on sand dunes at night.

DISTRIBUTION OF *Leichenum canaliculatum variegatum* IN THE U. S. A.

The only form of this genus that occurs in the United States is *Leichenum canaliculatum variegatum* (Klug), presumably introduced from Madagascar. The status of subspecies was given to *variegatum* by Gridelli (1939:233), the most recent reviser of the genus. Leng (1920:232) listed this form in his first catalogue, but I have been unable to find the literature citation on which his record was based. However, there is one specimen in the U. S. National Museum Collection that was donated by Charles Dury in 1934 and collected in Mobile in 1906. All information available to me on *variegatum* is herein presented to give some indication of its distribution and biology, in the hope that its biology will be studied more closely.

The actual date of introduction will almost certainly never be known, nor will the rate of dispersion to other areas, but we can get some indication of dispersion from collecting dates. It was taken in northern Florida, Alachua Co., by 1920; in southern Florida, Palm Beach Co., by 1927; and in South Carolina, Oconee Co., by 1933. The habits of *variegatum* are poorly known, or else it is rather ubiquitous in those habits. Loding stated that it was found in sand on the beach, and St. George (1930:122) reported on a larva that is possibly this subspecies as being associated with the roots of Bermuda grass as Mobile. Four other species or subspecies of *Leichenum* live in soil or sand near water, according to Gridelli (1939:209). It is likely that the preferred habitat of *variegatum*

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is in soil. Nevertheless, I have listed below all the biological data available, except for the many occurrences at light, no matter how improbable they may seem. Its occurrences throughout the year, as determined by labels, are June through July in Mississippi and Alabama, September in North and South Carolina, and March through October in Florida with most of the specimens being taken June through August. The range of distribution at present seems to be below 200 feet in the Coastal Plains Province from Mississippi to southern North Carolina, except that it extends into the upper limits, 850 feet, of the Piedmont Province in South Carolina. The following list of collecting data on *variegatum* is made up from specimens in the U. S. National Museum (USNM), Cornell University (CU), the Florida State Plant Board (FSPB), and from data at the University of Florida Experiment Station (UFES).

ALABAMA—*Baldwin Co.*: no further locality (CU); Daphne (CU USNM); on Bay shore, from roots of Bermuda grass, larva tentatively identified by St. George (USNM). *Mobile Co.*: Mobile (CU USNM). FLORIDA—*Alachua Co.*: no further locality (CU FSPB); Gainesville (CU FSPB USNM). *Dade Co.*: no further locality (USNM); Miami (FSPB); Route 27 and Miami Canal (USNM). *Duval Co.*: Jacksonville, on grass (FSPB). *Escambia Co.*: Pensacola (USNM). *Hendry Co.*: Clewiston (CU). *Highlands Co.*: Venus (FSPB). *Lake Co.*: Leesburg, damaging cotton (UFES). *Levy Co.*: no further locality, at *Arachis hypogaea* L. (FSPB). *Manatee Co.*: Bradenton (UFES). *Marion Co.*: no further locality, at *Zea* (FSPB); Citra, infesting ground among young turnips and rutabagas (UFES). *Orange Co.*: no further locality (USNM); Oakland, reported to be feeding on nap of rugs (UFES); Orlando, in greenhouse (FSPB); Winter Park (FSPB). *Palm Beach Co.*: Belle Glade (CU, USNM), bait trap (FSPB), larva from soil tentatively identified by St. George (USNM); Canal Point (CU); West Palm Beach (CU). *Polk Co.*: Lakeland (FSPB); Winterhaven, on Juniper (FSPB). *Putnam Co.*: Huntington, supposed to be killing peach trees (UFES). *Santa Rosa Co.*: Avalon, on grass (FSPB). *Wakulla Co.*: no further locality (USNM). *Washington Co.*: Chipley, in gin trash machine (USNM). GEORGIA—*Charlton Co.*: no further locality, fragments from stomach of *Bufo quericus* (USNM); Chesser Is., Okefenokee Swamp, fragments from stomach of toad (USNM). MISSISSIPPI—*George Co.*: Lucedale (CU). *Jackson Co.*: Horn Is. (USNM); Ocean Springs (CU). *Stone Co.*: Wiggins (CU). NORTH CAROLINA—*New Hanover Co.*: Carolina Beach, under boards (FSPB). SOUTH CAROLINA—*Barnwell Co.*: Edisto Exp. Sta., Blackville (USNM). *Oconee Co.*: Clemson College (USNM).

NEW DISTRIBUTIONAL AND BIOLOGICAL DATA FOR *Palorus foveicollis* BLAIR,
WITH A KEY TO THE SPECIES OF *Palorus* OF THE U. S. A.

This species has recently been discovered in three widely separated places, one of which is in the United States. *Palorus* (*Coelopalorus*) *foveicollis* was described by Blair (1930:135, 136, fig. 1) and was based on specimens from Burma, Andaman Is., Ceylon, India, Cocos Keeling Is., Philippine Is., and what is now the Malayan Federation. Corbett,

Yusope and Hassan (1937:67, pl. 6, figs. 13-17) occasionally found the species associated with copra, i.e., dried coconut meal, in Malaya. Adults and larvae feed very sparingly on the moulds of copra, but they seem to avoid eating good copra. It is not considered to be of importance in its association with copra. The authors illustrated and briefly described all four stages of life. Kulzer (1957:219) recorded it from Guam Is., and Usman and Puttarudraiah (1955:101) recorded it as *Coelopalorius foveicollis*, collected from mill sweepings, at Bangalore, Mysore, India.

Now the Hawaiian Islands must be added to the distribution. Mr. E. J. Ford, Jr., has brought to my attention material collected in light traps at the following places on the island of Oahu: Iroquois Point, Nov. 1947; Ewa, Aug. 1949 and July 1957; Waipio, Sept. 1952 and July 1957; Damon Tract, Feb. 1953; and Barber's Point, 1949. The specimen from Iroquois Point was reported by Zimmerman (1949:323) as a "genus near *Palorus*." On Oahu Mr. Ford has recently found *foveicollis* in the tunnels and powdery frass of the Lyctid *Lyctus curtulus* Casey and the Bostrichid *Sinoxylon conigerum* Gerstäcker in monkeypod, *Samanea saman* Merrill. Then, with another great leap eastward, we add Trinidad. Three individuals in the U. S. National Museum are labeled as follows: Government Stock Farm, St. Augustine, Trinidad, B.W.I., 24 April 1952, M. H. Breeze, in floor sweepings (maize). Finally, the southern United States is included. Two specimens were collected by W. T. Seibels at a commercial grain company in Mobile, Alabama, in October 1956, in wheat shorts, and two more were collected from the same establishment in November 1956 without host data. Mr. Seibels, investigating the possibility of the species' having been imported into Mobile, found that the grain company has received, directly or indirectly, many materials from South America. Even so, the true origin of the Mobile population is still a mystery, and we do not yet know whether the population has become established in the United States. There is no real indication that *foveicollis* is a pest, but it must be under suspicion at present because of the performance of two of its congeners, *ratzeburgi* and *subdepressus*, and because the American specimens were found in grain products.

Palorus foveicollis is quite distinctive. The pronotal depressions mentioned in the following key are very deep, extend the length of the pronotum, and widen posteriorly; the lateral carina of each elytron is situated on the anterior two-thirds of the seventh interval and is prominent. Like all *Palorus* species, *foveicollis* is small, but it is larger than our other two species; the ten specimens in the U. S. National Museum from Guam, Hawaii, Trinidad and Mobile range in length from 3.7 to

4.0 mm. and in width from 1.2 to 1.4 mm. The following key will differentiate the species of *Palorus* in the United States.

1. Pronotum with a deep, broad, long depression on each side of the midline; each elytron with a distinct carina on the seventh interval.....
Palorus (Coelopalorus) foveicollis Blair
- Pronotum evenly convex, without depressions; each elytron evenly convex transversely, without carina 2
2. Head with supra-antennal border extending over eye for a short distance and continuous with the supra-orbital carina, obscuring part of the eye in dorsal view.....
Palorus (Circomus) subdepressus (Wollaston)
- Head with supra-antennal border ending at the anterior margin of the eye, not continuous with the supra-orbital carina, not obscuring any part of the eye in dorsal view
Palorus (Palorus) ratzeburgi (Wissmann)

THE SPECIES OF *Eupsophulus* COCKERELL

In the original description of *Eupsophulus brevipennis*, Casey (1924: 323) mentioned the relatively large, erect elytral setae, but it is surprising that he did not put more emphasis on them as a distinguishing characteristic. These setae are arranged in nine longitudinal rows and are the only evidences of elytral striae in the genus. The punctures from which these setae originate are slightly larger than the much more numerous confused punctures, but the difference is so slight that the serial arrangement of the larger punctures would be hardly noticeable without their setae. In the other two species, *castaneus* (Horn) and *horni* (Champion), slightly larger punctures are seen, but they are not serially arranged. In all three species many of the punctures on the dorsal surface contain very minute appressed setae, which are slightly larger on the apex of the elytra, but these can not possibly be confused with the erect serial setae of *brevipennis*. In addition, the punctures of the elytra and especially of the pronotum are coarser and denser in *brevipennis* than in *castaneus*, though the difference is rather difficult to describe. The difference in over-all outline is not so great as Casey would have us believe, especially if we take into account the variation of form in *castaneus*.

Champion (1885:122) said of his new species *Eupsophus horni*, "prothorax finely, closely, and confluent punctured," and gave Mexico as the type locality. A specimen before me from Baja California matches Champion's description in all respects except that it has very coarse pronotal punctures. I have tentatively labeled that specimen as *horni* and have written the key that follows to include coarsely and finely punctate forms under *horni*. A comparison of the male genitalic structures of the two included forms of *horni* will undoubtedly resolve this question, for adequate specific differences are present in the genitalia of

the other species of *Eupsophulus*. Bypassing for the present the coarseness of the punctures of the pronotum of *horni*, we may say that these punctures are very close or contiguous. The punctures of the elytra are also coarser than in the other two species. Finally, the broader prothorax and the heavily wrinkled elytra are conspicuous.

In describing *brevipennis*, Casey (1924:323) cited two specimens from Benson, Arizona. However, in the Casey Collection there is one specimen labeled Tucson, Ariz., USNM Type No. 46798, and another labeled Benson, Ariz., USNM Paratype No. 46798. The Tucson specimen was labeled as holotype by Buchanan because it also held the specific name label; this method of labeling holotypes in the Casey Collection is discussed by Buchanan (1935:7). Casey might originally have had two specimens from Benson, one of which was later replaced. A more plausible explanation is that Casey did not read the Tucson label correctly; the label is small, and Casey's keenness of observation was probably failing him in his last years. Then, too, we must question all the specimens labeled "holotype" in the Casey Collection that were not definitely designated by Casey at the time of the original descriptions. Buchanan did an excellent piece of work in assembling the Casey material for study, but his mass selection of lectotypes—for that is what it certainly was—is contrary to the rules of nomenclature, even if Casey did indicate that such a thing should be done. The rules state that a selector of a lectotype should publish all pertinent data on the specimen for each species; this was not done for the Casey species. Thus, in the interest of consistency, I am now designating the specimen in the Casey Collection that is labeled Benson, Ariz., USNM Paratype No. 46798, as USNM Lectotype No. 46798 for *Eupsophulus brevipennis* Casey and am so labeling it.

This study is based on specimens in the U. S. National Museum (USNM) and the California Academy of Sciences (CAS). Even though I have many specimens of *castaneus* at hand, I will refrain from listing localities until a more complete distribution pattern is evident. The other two species are rare in collections, and all records of capture are worth citing. Nine specimens of *brevipennis* were collected from the following localities in Arizona—*Cochise Co.*: Benson (USNM), Palmerlee (USNM); *Pima Co.*: between Gunsight and Covered Wells (CAS), Tucson (USNM). The only available specimen of *horni*, which is tentatively identified, is from Mexico—*Baja California*: Coyote Cove, Conception Bay (CAS). The ensuing key can be used to distinguish the three known species of *Eupsophulus*.

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|---|--------------------------|
| 1. Elytra with obvious, erect, serially arranged setae..... | <i>brevipennis</i> Casey |
| 2. Elytra without setae or with very minute, confusedly arranged setae..... | 2 |

2. Pronotum with punctures dense, often confluent.....*horni* (Champion)
Pronotum with punctures not dense, not confluent.....*castaneus* (Horn)

Rues CASEY, 1891, A SYNONYM OF THE AUSTRALIAN *Adelium* KIRBY, 1818

Rues was erected by Casey (1891:66) for his previously described Californian species *Helops ovipennis*. It has remained in the Helopini to this day without discussion in the literature, save for catalogues, and without additional specimens having been found or reported. After an examination of the holotype of *ovipennis*, I am convinced that *Rues* is a junior synonym of *Adelium* Kirby of the tribe Adeliini. Except for two species described from South America, *Adelium*, with more than seventy species, occurs only in the Australian Region. Many of the genera of Australian Tenebrionids are restricted to the Australian or Indo-Australian Regions. Because of this and because no specimens of *ovipennis* have been found in seventy years, there is a strong probability that Casey's specimen accidentally entered the United States. The holotype of *ovipennis* is labeled "Cal.", but in the original description Casey (1890:487) gave the Mohave Desert of California as the type locality and then added, "... found dead by Mr. Dunn in a decaying stump." One immediately wonders how a specimen from Australia could have occurred accidentally in a stump in the then relatively isolated Mojave Desert. It is quite possible that the specimen came from Australia and was mislabeled. This might have happened during Casey's handling of the individual. On the other hand, almost anything might have happened, either accidentally or wilfully, while it was in the hands of the eccentric George W. Dunn, if we believe the information concerning him as reported by Essig (1931:605).

Because the specimens of *Adelium* available to me are poorly or not at all identified to species, I have not been able to correlate *ovipennis* with described species. However, in the U. S. National Museum there are six specimens from Victoria, Australia, labeled *Adelium* sp. which are similar to the holotype of *ovipennis*. In summation, *Rues* should be considered a junior synonym of *Adelium*, *ovipennis* should stand in *Adelium* as a good species until its proper relationships are known, and it should be stricken from the North American lists.

Reminius CASEY, A SYNONYM OF *Strongylium* KIRBY

Reminius was described by Casey (1924:321) for his new species *ocularis* (1924:322) from Keokuk, Iowa. He placed the genus in the Tenebrionini by discussing its similarities to *Xylopinus*. The holotype and only specimen is certainly *Strongylium terminatum* Say, a common

species which Casey did not otherwise have. Accordingly, *Reminius* is a junior synonym of *Strongylium* Kirby, 1818.

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