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NEW SPECIES OF LIZARDS OF THE  
GENUS *STENOCERCUS* FROM PERÚ  
(SAURIA: IGUANIDAE)

By

THOMAS H. FRITTS<sup>1</sup>

In the course of an evolutionary study of the genus *Stenocercus* seven unnamed species were studied in the field and laboratory. In order to facilitate discussion of the evolutionary relationships of the genus, these new species are described in the present paper. Although several other taxonomic problems exist, the nomenclature of Etheridge (1970) is used herein. A complete taxonomic review will be presented in a paper currently in preparation.

It has become apparent that the generic status of all species in the genera *Ophryoessoides* Duméril, 1851, and *Stenocercus* Duméril and Bibron, 1837, warrants consideration. My work indicates that many of the species presently included in *Ophryoessoides* are more closely related to species of *Stenocercus* than to other *Ophryoessoides*. All species named in this paper are members of the genus *Stenocercus* as it is viewed by me.

ACKNOWLEDGMENTS

I am grateful to Richard E. Etheridge for information on type specimens of *Stenocercus* and *Ophryoessoides* in European museums. He has generously shared specimens in his care and given freely of his time. William E. Duellman has encouraged me in my work with *Stenocercus* and provided energies in laboratory and field aspects of the study. Many persons in South America assisted

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in field work; I am particularly grateful to Oscar Ochoa M., Manuel Moro, Luis Inope, James Muir, and Hugo Paz. Access to the herpetological collections of several American institutions is gratefully acknowledged.

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## MATERIALS AND METHODS

The new species reported in the present report are represented in a collection of nearly 1000 specimens of the genus *Stenocercus* collected in the period of 1968-1972 and deposited in the University of Kansas Museum of Natural History (KU). Taxa are delineated on the basis of morphological and geographical discordance. The characters discussed in the diagnoses are numbered to facilitate comparison of character states between taxa; to avoid redundancy not all character states are given in each diagnosis. The ranges of characters presented in the diagnoses are based on all known specimens. The description is based on specimens from the type locality only. All other samples of the taxa are discussed in the "Remarks" section when pertinent. Geographic variation is examined through use of the Sum of Squares-Simultaneous Test Procedure (SS-STP). The SS-STP is an *a posteriori* test of significance of means (Sokal and Rohlf, 1969) and defines nonsignificant subsets of samples after significant variance is demonstrated by an overall analysis of variance. The test is used for samples of two means realizing that the probability level obtained from the analysis of variance is of an *a priori* test, not an *a posteriori* one. Significance in analyses with only two samples is therefore tentative.

## TAXONOMIC ACCOUNTS

### *Stenocercus apurimacus* new species

Figure 1B

*Holotype*.—KU 134273, an adult male, from Puente Pachachaca, 15 km west of Abancay, 1800 m, Departamento Apurimac, Perú, one of a series collected on 20-22 November 1969, by Thomas H. Fritts, Patricia R. Fritts, and Oscar Ochoa M.

*Paratopotypes*.—KU 134270-134272, 134274-134309, same data as holotype.

*Diagnosis*.—1) Posthumeral pocket deep; 2) postfemoral pocket absent; 4) scales posterior to tympanum equal in size to dorsal

neck scales, keeled, imbricate; 5) scales on posterior thigh keeled, imbricate; 6) vertebral row continuous, forming high dorsal crest extending onto tail; 7) caudal scales equal in size to ventrals, three caudal whorls per autonomic segment; 8) antehumeral fold absent; 9) neck fold absent; 10) scales around middle of body less than 62; 11) scales across gular region between tympana less than 27; 13) venter of males gray-beige to gray with a blue hue; 17) posterior head scales large, wider than long, rounded posteriorly, a pair of large parietals in broad contact posterior to small interparietal. *Stenocercus apurimacus* is the only species of *Stenocercus* occurring in southern Perú which lacks antehumeral and neck folds. *Stenocercus apurimacus* differs from species of *Ophryoessoides* in lacking keeled ventrals and an antehumeral fold and in having enlarged scales on the posterior margin of the head.

*Description.*—N=35; scales of parietal and occipital regions of head large, with curved posterior margins; head scales smooth and only slightly convex; interparietal small, bordered laterally by pair of large parietal scales which meet posterior to it; scales across occipital region between angulate temporals 6-9 ( $7.1 \pm 0.1804$ ); largest supraoculars nearly equal in size to scales of interorbital region; supraoculars at greatest width of semicircles 4-6 ( $5.4 \pm 0.094$ ). Scales of lateral neck imbricate and keeled, slightly smaller than dorsal neck scales; antehumeral and neck folds absent; scales across gular region between tympana 18-26 ( $23.0 \pm 0.362$ ).

Vertebral row continuous, forming high dorsal crest from occiput to tail; dorsal scales large, imbricate, keeled; scales around middle of the body 48-61 ( $52.3 \pm 0.519$ ); lateral and ventral scales approximately equal in size to dorsals; ventrals smooth; caudal scales normal; three caudal whorls per autonomic segment. Deep posthumeral pocket present; postfemoral pocket absent; scales of ventral surface of proximal forelimb large, imbricate, keeled; scales of posterior thigh smaller, imbricate and keeled; subdigital lamellae of the fourth finger 15-22 ( $17.9 \pm 0.256$ ); subdigital lamellae of fourth toe 21-28 ( $25.9 \pm 0.264$ ).

Coloration of males: Dorsum red-brown to medium brown with few indistinct black chevrons; narrow black collar edged posteriorly with white across lateral and dorsal neck; labial scales near the angle of the jaw black; chin white with few gray flecks; venter beige-white with faint blue or pink tint in some specimens; ventral pelvic region, ventral base of tail and ventral thighs dull yellow.

Coloration of Females: Dorsum brown with gold-bronze tint; dorsal and lateral surfaces of the neck gold-brown; chin and gular region black posterior to level of insertion of forelimb; chin white medially in some specimens; black collar absent; dorsal chevrons less distinct than those of males; venter gray-white.

*Distribution.*—The species is known in Perú from elevations of

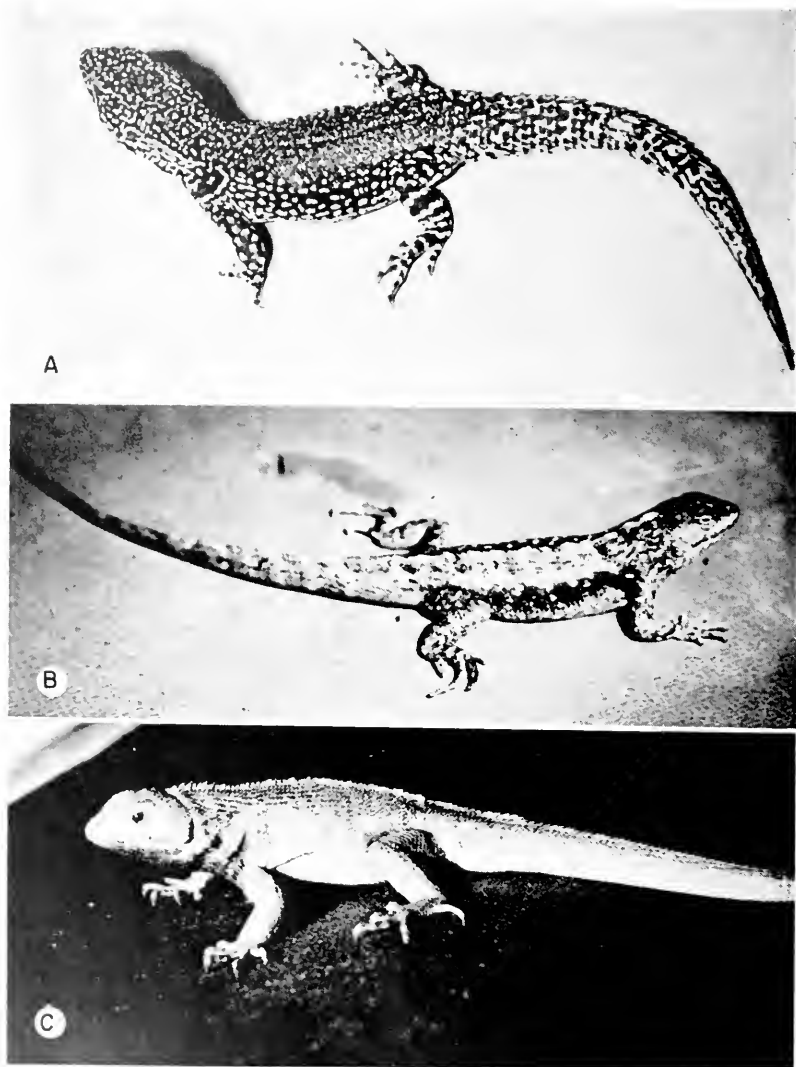


FIG. 1. A. *Stenocercus empetrus*, KU 134390, ♂ 92 mm in snout-vent length. B. *S. apurimacus*, KU 134285, ♂ 84 mm. C. *S. ochoai*, KU 133888, ♂ 95 mm.



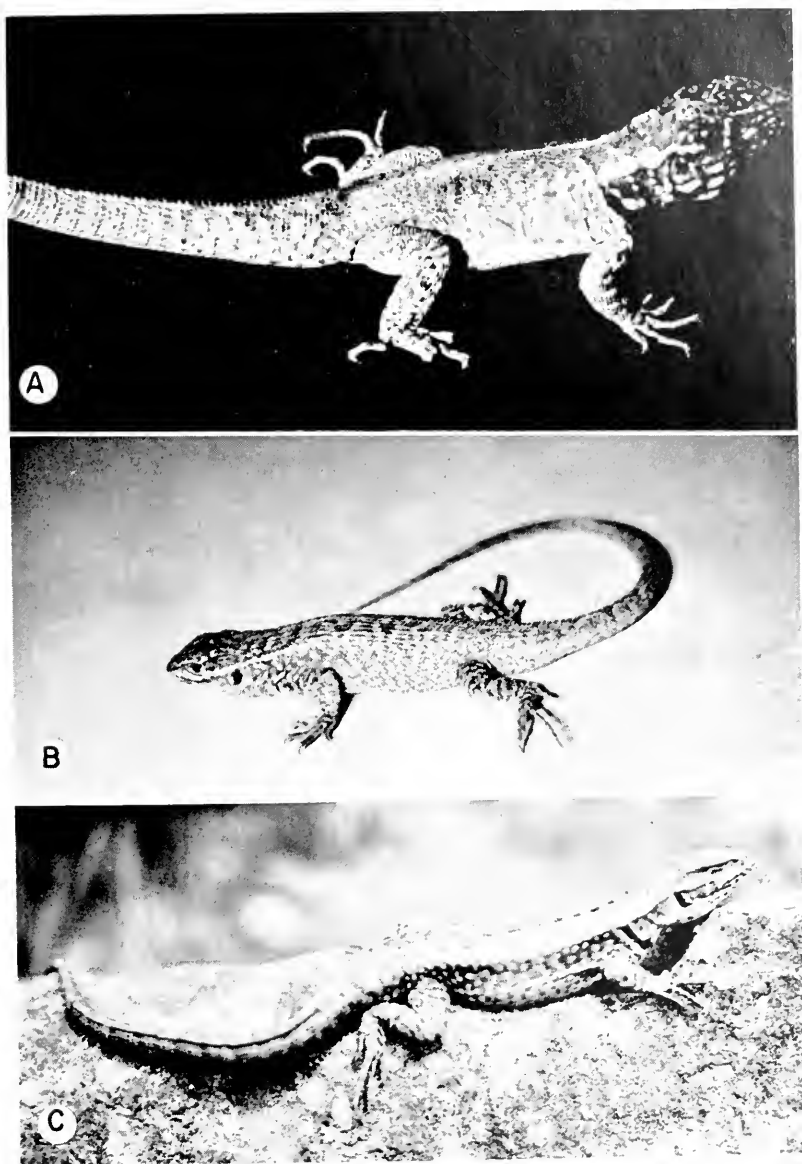


FIG. 2. A. *Stenocercus pracornatus*, cf. KU 134224-134232, ♂ approximate snout-vent length 100 mm. B. *S. orientalis*, KU 134456, ♂ 65 mm. C. *S. nubicola*, KU 134107, ♂ 72 mm.

1800 and 2700 m in the interandean valleys of the Río Apurimac and Río Pachachaca in the departments of Cuzco and Apurimac (Fig. 3). The upper valley of the Río Apurimac divides into several smaller valleys, of which the Río Pampas, Río Pachachaca and Río Apurimac valleys are the largest. Although *Stenocercus apurimacus* is known only from the last two valleys it is likely to occur in the former. Mountain ranges above 4000 m in elevation separate upper regions of the Río Pampas from the adjacent Río Mantaro drainage. The Cordillera Vilcabamba is largely above 5000 m and separates the Río Apurimac from the Río Urubamba.

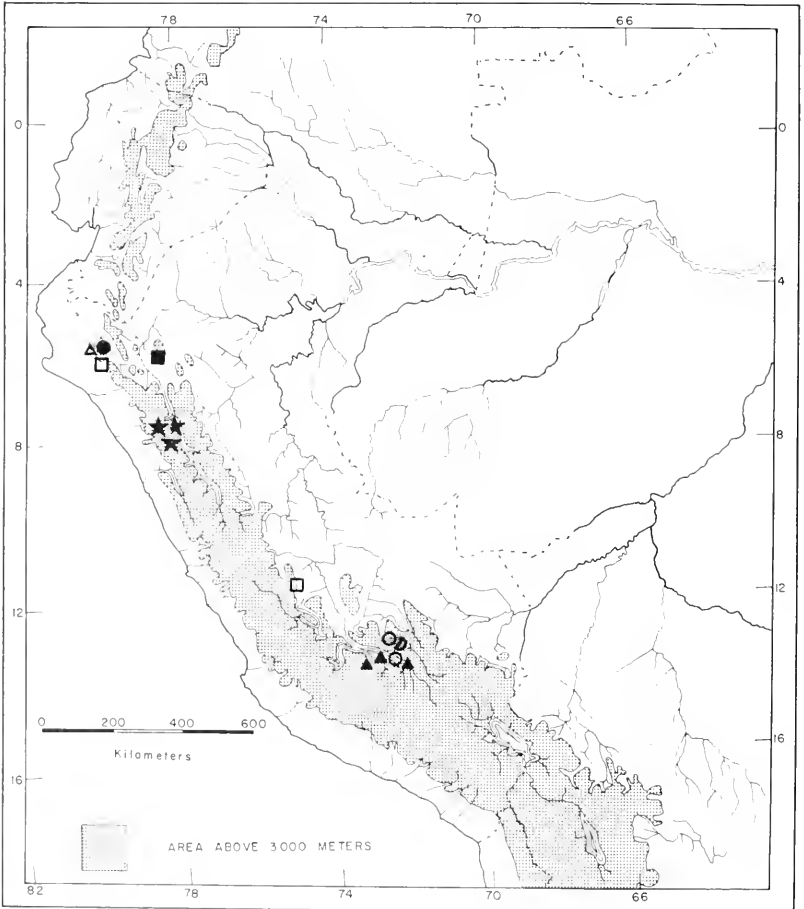


FIG. 3. Distribution in Perú of *Stenocercus apurimacus* (closed triangles), *S. ivitus* (open triangle), *S. uibicola* (closed circle), *S. ochoai* (open circles), *S. orientalis* (closed square), *S. pracomatus* (open squares), and *S. empetrus* (stars).

The Río Apurímac courses between high cordilleras until its junction with the Río Ene and Río Mantaro in central Perú.

*Ecological Observations.*—The species is found in xeric habitats throughout its range. At localities below 2400 m, *Acacia* and other thorn shrubs and cactus form the predominant plant cover. The lizards are active on the ground at the bases of shrubs and on rock piles. Localities at 2700 m are more mesic and have more grasses and shrubs. At these higher elevations individuals are observed in rows of *Agave*. *Stenocercus ochoai* occurs in sympatry with *S. apurimacus* at Curahuasi, 2700 m, Departamento Apurímac.

*Etymology.*—The trivial name for this lizard, which occurs throughout the drainage of the Río Apurímac, is a latinized noun from the Quechua language, *apu* meaning the great, and *rimac* meaning the talker or one who speaks. Guardia (1967) translated the word *apurimac* as meaning “el gran hablador” or great speaker. The species is dedicated to Dr. Philip S. Humphrey, who has allowed use of the facilities of the University of Kansas Museum of Natural History.

*Remarks.*—Specimens from the main valley of the Río Apurímac in the Departamento Apurímac (Puente Cuyac and Curahuasi) have more scales around the middle of the body than those from the type locality. The populational means for the two main valley localities (56.8 and 56.0 respectively) are included in a nonsignificant subset significant from the mean of the type locality (52.3) in SS-STP analysis,  $p < 0.05$ .

The extent of white coloration on the medial chin of females varies with altitude in the main valley of the Río Apurímac. Females from elevations below 2000 m have a solid black chin, whereas those from between 2000 and 2700 m on both sides of the valley have a gray-white or white region in the middle of the chin.

### *Stenocercus empetrus* new species

Figure 1A

*Holotype.*—KU 134394, an adult male from Huamachuco, 3350 m, Departamento La Libertad, Perú, one of a series collected on 16-17 April 1970 by Thomas H. Fritts and Patricia R. Fritts.

*Paratopotypes.*—KU 134379-134393, 134395-134400, same data as the holotype.

*Diagnosis.*—1) Posthumeral pocket absent; 2) postfemoral pocket large; 3) dorsals imbricate, smooth or weakly keeled; 4) scales posterior to tympanum granular, smaller than dorsal neck scales; 5) scales of posterior thigh granular; 6) vertebral row discontinuous, only a few scales on neck and anterior body morphologically distinct from adjacent dorsal scales; 7) caudals spinose, enlarged, subequal, two caudal whorls per autonomic segment; 8) antehumeral fold present; 9) neck fold well developed; 10) scales

around middle of body more than 86; 13) dorsal body dark brown or black, numerous yellow flecks and spots on dorsum in some populations.

Three species of *Stenocercus* have spinose caudal scutellation and lack a continuous vertebral row. *Stenocercus empetrus* differs from *S. marmoratus* (D'Orbigny, 1837) in having more than 86 scales around the middle of the body and in having more than 38 scales across gular region between tympana. *Stenocercus empetrus* differs from *S. carrioni* Parker, 1934, in having caudal whorls which are subequal in size and in having a more robust body. It differs from *S. simonsii* Boulenger, 1899, in lacking a vertebral row forming a distinct dorsal crest, in having smooth or weakly keeled dorsals, and in having a less spinose caudal scutellation.

*Description*.—N=21; scales of dorsal head small, subequal in size, convex; scales of posterior head similar to dorsal neck scales; posterior margin of head indistinct; temporal region bulbous; interparietal scale not distinct, parietal eye lacking; scales across occipital region between angulate temporals 14-17 ( $15.3 \pm 0.211$ ); supraocular scales small subequal in size, lacking rugosities and keels; supraoculars at greatest width of semicircle 5-7 ( $5.8 \pm 0.118$ ); head scales along medial line between occiput and rostral 16-20 ( $17.9 \pm 0.217$ ). Scales of lateral neck granular, smaller than dorsal neck scales; antehumeral fold present, lined with granular scales; neck folds well developed, connected to antehumeral fold by longitudinal fold in some specimens; largest neck fold extending ventrally across gular region in some specimens; scales of gular region between tympana small, 39-49 ( $43.1 \pm 0.599$ ).

Vertebral row discontinuous; vertebral scales distinct from adjacent scales on neck only, forming an incomplete dorsal crest in some specimens; dorsal scales imbricate, smooth or weakly keeled, scales around middle of body 90-112 ( $99.9 \pm 1.140$ ); scales of lateral body less than one-half size of dorsals, granular, meeting dorsals abruptly in dorsolateral region; caudal scales large, with heavy keels which project slightly beyond posterior margins of scales; two caudal whorls per autonomic segment; dorsomedial row of caudal scales lacking enlarged keels, not forming high crest. Posthumeral pocket absent; postfemoral pocket formed by large fold; scales of ventral surface of proximal forelimb granular; scales of posterior thigh granular; subdigital lamellae of fourth finger 19-25 ( $21.9 \pm 0.379$ ); subdigital lamellae of fourth toe 25-32 ( $29.0 \pm 0.495$ ).

Coloration: Little sexual dimorphism in color pattern; dorsal ground color black, heavily flecked and spotted with pale yellow; lateral neck and body black with prominent yellow spots in irregular longitudinal and transverse rows; head black with numerous yellow flecks; prominent red spots in interorbital and occipital region; venter of males orange-yellow with heavy black reticulations; chin

of males orange-yellow with black or bright yellow with black reticulations; venter of females yellow with black reticulations.

*Distribution.*—In addition to the type locality the species is known from Laguna Sacsacocha, 12 km E Huamachuco, 3200 m, Departamento La Libertad; Otuzco, 2730 m, Departamento La Libertad; Cajamarca, 2800 m, Departamento Cajamarca; and 3 km E Celendín, 2650 m, Departamento Cajamarca (Fig. 3). All of the localities, except Otuzco, are in the drainage of the Río Crisneja and adjacent tributaries of the Río Marañón. The single locality in the Pacific drainage, Otuzco, is in the upper valley of the Río Moche.

*Ecological Observations.*—Individuals of both sexes are found in large rock piles and rock exposures. *Stenocercus melanopygus* Boulenger, 1900, occurs in sympatry with *S. empetrus* throughout the distribution of the latter species in the Atlantic drainage; *S. melanopygus* is common on the ground at the bases of shrubs, on solitary rocks, and at the periphery of large rock piles. *Stenocercus empetrus* is common in the mesic habitats near Huamachuco and Celendín but rare on the dry slopes near Cajamarca, despite the availability of large rocks and rock piles preferred at other localities. The black coloration of individuals from Celendín closely matches the black volcanic rocks on which the lizards occur. *Stenocercus empetrus* is also sympatric with *S. ornatissimus* (Girard, 1857) on the Pacific slopes near Otuzco. The latter species was abundant in agave rows and at the bases of shrubs; habitat partitioning between the two species similar to that observed on Atlantic slopes is probable.

*Stenocercus empetrus* differs from the two species with which it is sympatric in several notable aspects. It differs in lacking marked sexual dimorphism in the ventral coloration and in having enlarged and spinose caudal scutellation, a bulbous temporal region, smooth or weakly keeled dorsals, granular scales on lateral body and neck, and a larger body size.

*Etymology.*—The trivial name is from the Greek *empetros* meaning rock-dwelling and refers to the preferred habitat of the species.

*Remarks.*—Individuals of this species from Celendín, 2650 m, Departamento Cajamarca, differ from those from the type locality in having greater sexual dimorphism in coloration. Adult males are entirely black, except for a few small white flecks on the lateral body and posterior surface of the thighs. Subadult males are black to brown-black with transverse rows of small white spots extending from the dorsum to the lateral edge of venter. The antehumeral fold is black and outlined on anterior and posterior margins with white scales. The venter is white with gray reticulations whereas the chin is black with white spots. The posterior one-half of the venter has a pink suffusion. Adult females are medium gray with faint transverse rows of white flecks. The venter is gray-white with

a pink suffusion on the posterior one-half. Juveniles are similar to females, except in having more prominent white flecks on lateral body.

Individuals from Cajamarca, 2800 m, Departamento Cajamarca, are somewhat similar in coloration to subadult males from Celendín, except in having equal numbers of yellow-beige and black scales on the dorsal and lateral body. The occipital region of the head is black whereas the interorbital region has a few scales which are dull red-brown. The venter is orange-yellow with prominent black spots and reticulations.

The number of paravertebral scales is higher in the specimens from Celendín than in those of other localities ( $p < 0.05$ ; SS-STP). The dorsal scales are smooth in the majority of specimens from Celendín, whereas they are smooth laterally and weakly keeled medially in specimens from other localities.

### *Stenocercus ivitus* new species

*Holotype*.—KU 134654, an adult female from summit of Cordillera Huancabamba between Canchaque and Huancabamba, 3100 m, Departamento Piura, Perú, obtained on 11 May 1970, by Thomas H. Fritts and Patricia R. Fritts.

*Diagnosis*.—1) Posthumeral pocket absent; 2) postfemoral pocket present; 4) scales posterior to tympanum nearly equal in size to dorsal neck scales, imbricate, keeled; 5) scales of posterior thigh granular; 6) vertebral row discontinuous, vertebral scales not forming dorsal crest; 7) caudals normal, three caudal whorls per autonomic segment; 8) antehumeral fold absent; 9) neck fold absent; 10) scales around middle of body 44.

*Stenocercus ivitus* differs from all species of *Ophryoessoides* and *Stenocercus* in lacking antehumeral and neck folds, in lacking a continuous vertebral scale row which forms a dorsal crest, and in having granular scales on the posterior surface of the thigh.

*Description*.— $N=1$ ; head scales moderate in size, subequal, prominently keeled; 16 scales on middorsal line between occiput and rostral; supraoculars subequal, keeled. Interparietal scale lacking unpigmented spot of parietal eye; scales of occipital region equal in size to dorsal neck scales, posterior margin of head indistinctly demarcated from dorsal neck; a longitudinal row of angulate temporal scales from posterior margin of eye to posterior margin of head scales; 11 scales between angulate temporals across occipital region. Scales of anterior margin of tympanic opening slightly denticulate, projecting into opening; scales of lateral neck large, equal in size to dorsal neck scales, imbricate, keeled; scales posterior to tympanum imbricate, keeled; no antehumeral fold; no neck folds; 21 scales across the gular region between tympana.

Vertebral scales not in continuous row, similar to adjacent dor-

sals, not forming distinct dorsal crest; dorsal scales imbricate, keeled, mucronate, lanceolate; lateral scales equal in size to dorsals; ventral scales imbricate, smooth, lanceolate; 44 scales around middle of body. Scales of posterior thigh granular; scales of ventral surface of proximal forelimb imbricate, keeled; no posthumeral pocket; postfemoral pocket moderate in size; 20 subdigital lamellae on fourth fingers; 26 subdigital lamellae on fourth toe. Caudal scales normal, imbricate, keeled; three caudal whorls per autonomic segment.

Coloration of Female: Dorsum light brown with large black blotches in two longitudinal rows between yellow dorsolateral stripes; light yellow stripe on lateral neck and body from ventral margin of tympanum to base of hind limb; venter white with pinkish bronze tint; dark flecks on gular region; indistinct black lines on lateral venter.

*Distribution.*—*Stenocercus ivitus* is known only from the type locality at the summit of the Cordillera Huancabamba (Fig. 3). This cordillera forms the continental divide between the Río Piura (Pacific drainage) and the Río Huancabamba (Atlantic drainage).

*Ecological Observations.*—The adult female was observed basking on a pile of dead branches at the margin of a low shrub-forest. The moist forest at this locality is produced by moisture-saturated winds coming from the Pacific. The western side of the summit has a low cloud forest, whereas the eastern side is drier with only local patches of forest and extensive tall grasses. *Stenocercus ivitus* is known to occur in sympatry with *S. nubicola*.

*Etymology.*—The trivial name is a latinized acronym of the Instituto Veterinario de Investigaciones Tropicales y de la Altura, a cooperative research institute of the Universidad San Marcos and the United Nations FAO. The faculty and staff of IVITA assisted field studies through provision of facilities and logistical support.

### *Stenocercus nubicola* new species

Figure 2C

*Holotype.*—KU 134107, an adult male, one of a series from summit of Cordillera Huancabamba between Canchaque and Huanca-bamba, 3100 m, Departamento Piura, Perú, collected on 11 May 1970 by Thomas H. Fritts and Patricia R. Fritts.

*Paratopotype.*—KU 134108, a juvenile male with same data as the holotype.

*Diagnosis.*—1) Posthumeral pocket absent; 2) postfemoral pocket present; 4) scales posterior to tympanum less than one-half size of dorsal neck scales, imbricate and smooth or granular; 5) posterior thigh granular; 6) vertebral row complete, forming dorsal crest; 7) caudal scales equal in size to ventrals, keeled, three caudal whorls per autonomic segment; 8) antehumeral fold distinct; 9)

neck fold present; 10) scales around middle of body more than 90; 11) scales across gular region between tympana fewer than 40; 13) black midventral stripe in males, bifurcate anteriorly, extending onto ventral thighs posteriorly.

*Description.*— $N=2$ ; head scales smooth, slightly convex, larger than supraoculars, subequal; scales along medial line between occiput and rostral 17; supraoculars subequal, smooth; supraoculars in transverse line at greatest width of semicircles 5-6; scales of occipital region rough, not keeled, distinct from dorsal neck scales; scales across occipital region between angulate temporals 10-12; parietal eye absent; anterior margin of auricular opening with three denticulate scales; antehumeral fold present; neck folds present; scales posterior to tympanum imbricate and smooth, smaller than dorsal neck scales; scales across gular region between tympana 38-39.

Vertebral row continuous, forming distinct dorsal crest; dorsal scales small, imbricate, keeled; laterals slightly smaller than dorsals; scales around middle of body 93-94; scales of posterior thigh granular; scales of ventral humerus imbricate, smooth; posthumeral pocket absent; postfemoral pocket distinct; subdigital lamellae of fourth finger 17-22; subdigital lamellae of fourth toe 24-28; caudal scales equal in size to ventrals, keeled; three caudal whorls per autonomic segment.

Coloration of Male: Chin, gular region and ventral pectoral region white with numerous black spots; wide charcoal-gray midventral stripe, bifurcating anteriorly to axilla, bifurcating onto ventral thighs posteriorly; lateral body and lateral venter light green with numerous red-orange spots and flecks; dorsum medium brown with small dark brown or black blotches; beige dorsolateral stripes connected with white loreal region; supralabials and infra-labials black. Numerous light blue-green transverse markings on dorsum; collar fold bordered posteriorly by black bar.

Coloration of Juvenile: Dorsum gray-brown; dorsolateral stripes beige.

*Distribution.*—*Stenocercus nubicola* is known only from the type locality (Fig. 3). The Cordillera Huancabama forms the continental divide in extreme northern Perú and separates the Río Huancabama Valley (Atlantic drainage) and the Río Piura Valley (Pacific drainage).

*Ecological Observations.*—*Stenocercus nubicola* occurs in sympatry with *Stenocercus ivitus*. The holotype was observed basking on a fallen tree limb in an open areas of the low montane shrub-forest. *Stenocercus nigromaculatus* Noble, 1924, is known at lower elevations in the same region.

*Etymology.*—The trivial name is from the Latin *nubes* meaning cloud and *cola* meaning dweller. The name refers to the association



of the species with the heavy fogs characteristic of the Pacific slopes in northern Perú.

***Stenocercus ochoai* new species**

Figure 1C

*Holotype*.—KU 133888, an adult male, one of a series from Chilca, 10 km NW Ollantaytambo, 2700 m, Departamento Cuzco, Perú, collected on 30 November 1969 by Thomas H. Fritts, Patricia R. Fritts and Oscar Ochoa M.

*Paratypes*.—KU 133874-133887, 133889, 139263. Topoparatypes with same data as holotype, except KU 133874-133883 collected 15-16 November 1969, KU 133889 collected 17 January 1970, and KU 139263 collected 9 January 1971.

*Diagnosis*.—1) Posthumeral pocket absent; 2) postfemoral pocket deep; 3) dorsal scales but slightly larger than lateral scales, imbricate, keeled; 4) scales posterior to tympanum one-half size of dorsal neck scales, imbricate, usually keeled; 5) scales of posterior thigh imbricate, keeled; 6) vertebral row continuous, forming raised dorsal crest; 7) caudal scales approximately equal in size to ventrals, three caudal whorls per autonomic segment; 8) antehumeral fold present; 9) neck fold present; 10) scales around body fewer than 71; 11) scales across gular region between tympana fewer than 27; 13) venter of adult males black.

*Stenocercus ochoai* is most similar to *Ophryoesoides arenarium* (Tschudi, 1845) from which it differs in having larger dorsal scales, black ventral coloration in males, and only three caudal whorls per autonomic segment.

*Description*.— $N=12$ ; head scales convex, not keeled, subequal; scales of lateral occipital region largest of head scales; parietal eye indistinct or absent; head scales distinct from dorsal neck scales; scales across occipital region between angulate temporals 8-12 ( $10.3 \pm 0.333$ ); scales on medial line between occiput and rostral 16-19 ( $17.1 \pm 0.285$ ). Entire anterior margin of tympanic opening with denticulate scales; antehumeral fold prominent; neck folds present, occasionally extending onto ventral neck, not forming strong gular fold; scales posterior to tympanum approximately one-half size of dorsal neck scales, imbricate, usually keeled; scales across gular region between tympana 20-26 ( $22.7 \pm 0.582$ ); dorsals imbricate, keeled; lateral scales slightly smaller than dorsals; vertebral row continuous, forming distinctly raised dorsal crest; keels of dorsal scales forming longitudinal lines which converge only slightly on posterior one-half of body; scales around middle of body 56-67 ( $61.7 \pm 0.882$ ). Caudals approximately equal in size to ventrals, keeled, three caudal whorls per autonomic segment; scales of ventral surface of upper arm large, imbricate, weakly keeled; scales of posterior thigh imbricate, keeled; subdigital lamellae of fourth finger

18-21 ( $19.8 \pm 0.241$ ); subdigital lamellae of fourth toe 24-31 ( $27.5 \pm 0.634$ ); posthumeral pocket absent; postfemoral pocket deep.

Coloration of Males: Dorsum medium to copper brown with occasional small black blotches; lateral body, limbs and tail brown with lime-green suffusion; ventrolateral body greenish yellow; chin light yellow with extensive black suffusion; venter dull black with some yellow laterally; anal area, ventral base of tail and ventral thighs dull yellow, occasionally with black suffusion.

Coloration of Females: Dorsum gray-brown to charcoal with occasional beige or light gray scales; lateral body light brown; ventrolateral body gray-brown with bronze or light red-orange suffusion; venter beige-white; chin beige-white with gray suffusion; lateral neck same as dorsal ground color. Juveniles similar with dark brown blotches on dorsum.

*Distribution.*—*Stenocercus ochoai* (Fig. 3) is known between 2000 and 3000 m in the valleys of the Río Urubamba (Burt and Burt, 1930) and Río Apurímac (Mertens, 1952). The two rivers are separated by the Cordillera Vilcabamba in excess of 4000 m elevation.

*Ecological Observations.*—*Stenocercus ochoai* occurs in sympatry with *Stenocercus crassicaudatus* (Tschudi, 1845) between 2000 m and 2600 m in the Río Urubamba Valley. It occurs in sympatry with *Stenocercus apurimacus* at Curahuasi, 2700 m, Departamento Apurímac, in the Río Apurímac Valley. In areas of allopatry, individuals can be observed using the ground substrate, bases of shrubs, isolated rocks and rock piles for feeding and basking activity. Males tend to occupy rocks whereas females are more frequently found on the ground. In sympatry with the rock-dwelling *Stenocercus crassicaudatus*, *S. ochoai* is confined to the ground, isolated rocks and small rock piles.

*Etymology.*—The trivial name is a patronym for Dr. Oscar Ochoa M., who generously provided assistance and support with field work in southern Perú.

*Remarks.*—Specimens of *Stenocercus ochoai* have been erroneously reported by Barbour and Noble (1920) and Burt and Burt (1930) under the names *Liocephalus ervingi* (Stejneger, 1913) and *Liocephalus arenarius* (Tschudi, 1845), respectively.

### *Stenocercus orientalis* new species

Figure 2B

*Holotype.*—KU 134466, an adult male, one of a series from Chachapoyas, 2340 m, Departamento Amazonas, Perú, collected on 2 May 1970, by Thomas H. Fritts and Patricia R. Fritts.

*Paratopotypes.*—KU 134447-134465, 134467-134473 collected 1-2 May 1970.

*Diagnosis.*—1) Posthumeral pocket absent; 2) postfemoral pocket present; 4) scales posterior to tympanum half size of dorsal

neck scales, imbricate, keeled; 5) scales of posterior thigh granular; 6) vertebral row continuous, not forming dorsal crest; 7) caudal scales approximately equal in size to ventrals, keeled, three caudal whorls per autonomic segment; 8) antehumeral fold present; 9) neck fold present; 10) scales around the middle of the body 47-58; 15) head scales prominently keeled.

*Stenocercus orientalis*, *S. ornatissimus* (Girard, 1857), *S. moestus* Boulenger, 1885, *S. chrysopygus* Boulenger, 1900, and *Ophryoesoides haenschi* (Werner, 1901) differ from other species of *Stenocercus* and *Ophryoesoides* in lacking a dorsal crest and spinose caudal scutellation, and in having antehumeral and neck folds. *Stenocercus orientalis* is uniquely characterized by prominently keeled scales on the snout and interorbital region. It differs from *S. ornatissimus* in having a well-developed postfemoral pocket, and from *S. moestus* in having more than 47 scales around the middle of the body. *Stenocercus orientalis* is distinguished from *S. haenschi* by the absence of green dorsal coloration and presence of fewer than 30 scales across the gular region. It differs from *S. chrysopygus* in having imbricate scales posterior to the tympanum and keels of dorsals in continuous longitudinal series.

*Description*.— $N=27$ ; head scales subequal, keeled; supraoculars subequal, keeled; parietal eye only occasionally visible as unpigmented spot on small interparietal scales; head scales distinct from those of dorsal neck; 10-13 ( $12.0 \pm 0.173$ ) scales across occipital region between angulate temporals; 14-18 ( $16.3 \pm 0.267$ ) scales on middorsal line between occiput and rostral. Anterior margin of auricular opening with 1-2 denticulate scales projecting into opening; antehumeral fold prominent; neck fold present; scales posterior to dorsal one-half of tympanum imbricate, keeled, nearly granular, less than one-half size of dorsal neck scales. Scales on edges of antehumeral and neck fold larger than adjacent scales, keeled, imbricate; 23-38 ( $25.4 \pm 0.289$ ) scales across gular region between tympana. Dorsals imbricate, keeled; vertebral row continuous, not forming dorsal crest; keels of dorsal scales forming longitudinal lines converging slightly posteriorly; 47-58 ( $51.9 \pm 0.552$ ) scales around middle of body. Caudals approximately equal in size to ventrals, keeled; three caudal whorls per automatic segment. Scales of ventral humerus keeled, imbricate; scales of posterior thigh granular; 17-22 ( $19.7 \pm 0.275$ ) subdigital lamellae on fourth finger; 25-31 ( $27.7 \pm 0.287$ ) subdigital lamellae on fourth toe; posthumeral pocket absent; postfemoral pocket deep.

*Coloration of Males*: Head brown with a few light spots; light stripe from under eye to dorsolateral region of shoulder; dorsum brown with irregular dark brown or black blotches; blotches occasionally forming chevrons; ventral pelvic region and ventral thighs yellow; chin and gular region beige, similar to venter.

Coloration of Females: Dorsum brown; gray-white stripe from under eye extending posteriorly dorsal to tympanum and onto dorso-lateral body; two rows of irregular dark blotches on dorsum; vertebral stripe absent; chin and venter gray-beige.

*Distribution.*—The species is known in Perú only from the type locality in the valley of the Río Utcubama (Fig. 3). The Río Marañón Valley has an elevation of less than 1000 m at this latitude and bounds this range of the Andes on the west and north. The most eastern ridge of the Andes, reaching above 3000 m at this latitude, is immediately east of Chachapoyas. The extremely xeric valley of the Río Marañón is in extreme contrast with the moist eastern slopes.

*Ecological Observations.*—In the vicinity of Chachapoyas patches of open chaparral are intermixed with low montane forest. The species was collected in open areas at the bases of shrubs. There are few exposed rocks in the immediate area; lizards seek refuge in holes at the bases of shrubs and in tall grasses. No other iguanid species is known in the area.

*Etymology.*—The trivial name is from the Latin *oriens* meaning east and refers to the distribution of the species east of the Río Marañón valley.

### *Stenocercus praeornatus* new species

Figure 2A

*Holotype.*—KU 134231, an adult male, one of a series from Comas 3220 m, Departamento Junín, Perú, collected on 26-27 September 1969, by Thomas H. Fritts and Patricia R. Fritts.

*Paratopotypes.*—KU 134224-134230, 134232, same data as holotype.

*Diagnosis.*—1) Posthumeral pocket consisting of weak fold; 2) postfemoral pocket large; 4) scales posterior to tympanum granular, less than one-half size of dorsal neck scales; 5) scales of posterior thigh granular; 6) vertebral row continuous, forming high dorsal crest; 7) caudals approximately equal in size to ventrals, keeled, three caudal whorls per autonomic segment; 8) antehumeral fold present; 9) neck fold present; 10) scales around middle of body more than 88; 13) ventral coloration of males rose pink; 14) gular region of males black.

Of the species having a black ventral collar in males, *Stenocercus praeornatus* is the only one having more than 88 scales around the middle of the body and having pink ventral coloration in males.

*Description.*—N=9; scales of head subequal, convex, not keeled; supraoculars smooth, not greatly enlarged; supraoculars at greatest width of semicircles 5-7 ( $6.3 \pm 0.236$ ); scales of medial region of occipital area granular, smaller than more lateral scales, scales across occipital region between angulate temporals 12-14 ( $13.3 \pm$

0.236); parietal eye absent, interparietal indistinct; scales of dorsal snout slightly larger than other head scales; scales along midline between occiput and rostral 17-20 ( $18.8 \pm 0.324$ ). Scales of anterior margin of auricular opening only weakly projecting into ear; antehumeral fold prominent; neck folds often connected with antehumeral fold; scales posterior to tympanum granular, less than one-half size of dorsal neck scales; neck fold continuing ventrally, meeting its fellow, forming a weak gular fold in some specimens; scales across gular region between tympana 40-57 ( $48.2 \pm 1.786$ ).

Vertebral row continuous; vertebral scales forming distinct raised dorsal crest; skin of lateral neck folded, forming slight dorso-lateral fold from dorsal margin of tympanum to point posterior to scapular region; dorsal scales imbricate, keeled; scales around middle of body 100-121 ( $106.8 \pm 2.29$ ); lateral scales less than one-half size of dorsal scales, granular or slightly imbricate; lateral scales sharply meeting dorsals at dorsolateral region; shallow fold in axillary region forming shallow posthumeral pocket; postfemoral pocket large; dorsal crest continuing onto tail; caudal scales approximately equal in size to ventrals, imbricate, keeled; three caudal whorls per autonomic segment. Scales of ventral humerus imbricate, keeled or smooth; scales of posterior thigh granular; subdigital lamellae of fourth finger 20-22 ( $20.8 \pm 0.324$ ); subdigital lamellae of fourth toe 28-31 ( $29.4 \pm 0.324$ ).

Coloration of Males: Head dull chocolate brown with scattered yellow-beige spots; nape dull brown posterior to level of shoulders with diagonal yellow markings and spots; dorsum gray-brown with faint irregular darker brown diamond blotches; lateral areas light yellow-brown with dull yellow spots; chin gray-brown peripherally; central chin blue-green with yellow spots; gular region rose pink with faint gray reticulation; chest anterior to pectoral girdle jet black; ventral pectoral region, ventral fore- and hindlimbs and narrow midventral line pale yellow; lateral venter rose pink; base of tail yellow with orange tint.

Coloration of Females: Dorsum gray-beige with middorsal brown blotches; dorsal blotches paired, nearly connecting medially; venter gray-white; ventral thighs with slight yellow tint; chin beige with gray-brown spots or reticulations.

*Distribution.*—The species is known in central Perú from the higher elevations of the Río Tulumayo in Departamento Junín (Fig. 3). Additional specimens of this species are known from northern Perú, Abra Porculla, 2144 m, Departamento Piura. Although both localities from which the species is known are Amazonian, the major river valleys of the Río Marañón and Río Huallaga are between them. A similar distribution is exhibited by *Stenocercus boettgeri* Boulenger, 1911.

*Ecological Observations.*—No other iguanid species is known to

occur in sympatry with *S. praeornatus*. Populations of *S. variabilis* Boulenger, 1901, and *S. boettgeri* are known from geographically close areas of Departamento Junín. *Stenocercus praeornatus* was collected in large rock piles and in terraces made of rocks. Because *S. variabilis* is largely confined to terrestrial habitats and small rocks, sympatry with *S. praeornatus* is more probable than with the rock-dwelling species, *S. boettgeri*.

*Etymology*.—The trivial name is from the Latin *prae* meaning front or anterior part and *ornatus* meaning ornate; it refers to the ornate coloration of the head and shoulders in contrast to that of the remainder of the body.

*Remarks*.—Five specimens from Abra Porculla in northern Perú have fewer scales across the gular region between tympana, 32-35 ( $33.0 \pm 0.632$ ), than topotypic specimens 40-57 ( $48.2 \pm 1.786$ ). The scales around the body in specimens from the former locality range from 89 to 112 ( $97.8 \pm 3.219$ ). Females from Abra Porculla lack dark blotches on the chin. Although differences in scutellation between the two populations are suggested by the small samples available, acquisition of more material is necessary to assess geographic variation. The close similarity in most scutellational aspects, as well as in coloration, is the basis for assignment of the northern population to this species.

## RESUMEN

Mientras un estudio evolucionario del género *Stenocercus* corriente, siete especies nuevas estaban siendo estudiadas. Las especies nuevas que están siendo descritas son de zonas poco conocidas en los Andes Peruanos. Discordancia de dato morfológicos, geográficos, y ecológicos es la base de la delimitación taxonómica. El presente conocimiento necesita consideración de la posición generica de todas las especies en *Ophryoessoides* y *Stenocercus* con motivo de formación de grupos naturales que conformen con relaciones evolucionarias. Algunas especies de *Ophryoessoides* son más afines con *Stenocercus* que otras especies de *Ophryoessoides*. La variación morfológica, distribución geográfica, y preferencias ecológicas son presentados para cada especie.

## SPECIMENS EXAMINED

The following abbreviations are used to indicate the museums housing specimens examined in this study: AMNH, American Museum of Natural History; FMNH, Field Museum of Natural History; KU, University of Kansas Museum of Natural History; MCZ, Museum of Comparative Zoology; MVZ, Museum of Vertebrate Zoology—Berkeley; SM, Senckenbergische Natur-Museum; UMMZ, University of Michigan Museum of Zoology; USNM, United States

National Museum. Specimens are listed alphabetically by species, country, state and locality.

*Stenocercus apurimacus*

PERÚ: *Apurimac*: Curahuasi, 2700 m, KU 134240, 134242-134249, 134251-134252; Hacienda Matara, Dist. Matara, MCZ 62253; Puente Pachachaca, 1800 m, KU 134270-134309; Río Apurimac, Puente Cunyac, 1830 m, KU 134235-134239, 134253-134257. *Cuzco*: Limatambo, 2700 m, KU 134263-134269; 3 km E Puente Cunyac, 1830 m, KU 134258; 8 km E Puente Cunyac, 2300 m, KU 134259-134262.

*Stenocercus empetrus*

PERÚ: *Cajamarca*: Baños, MCZ 8084; Cajamarca, 2800 m, FMNH 3941-3942, 5710-5711, KU 134411-134413; 3 km E Celendín, 2650 m, KU 134414-134427; Hacienda Huagac, UMMZ 60094-60095. *La Libertad*: Huamachuco, 3350 m, KU 134379-134400; Laguna Sacsacochoa, 12 km E Huamachuco, 3200 m, KU 134401-134410; Otuzco, FMNH 5708.

*Stenocercus ivitus*

PERÚ: *Piura*: Summit of Cordillera between Canchaque and Huancabamba, 3100 m, KU 134653.

*Stenocercus nubicola*

PERÚ: *Piura*: Summit of Cordillera between Canchaque and Huancabamba, 3100 m, KU 134107-134108.

*Stenocercus ochoai*

PERÚ: *Apurimac*: Curahuasi, 2700 m, KU 134241, 134250. *Cuzco*: Chilea, 10 km N Ollantaytambo, 2760 m, KU 133874-133889, 139263; Chospyoc, Río Huaracocondo, USNM 60705-60706; Ruinas de Machu Picchu, 2400-2450 m, KU 117108, 134233-134234, 139267-139268; Ollantaytambo, USNM 60810, MCZ 41984; Río Huaracocondo, 3048 m, MCZ 12410; Torontoy, USNM 60811.

*Stenocercus orientalis*

PERÚ: *Amazonas*: Chachapoyas, 2340 m, KU 134447-134473.

*Stenocercus praecornatus*

PERÚ: *Juán*: Comas, 3220 m, KU 134224-134232. *Piura*: Abra Porculla, 2144 m, SM 65252, 65254, 65257-65259, MVZ 82370.

## LITERATURE CITED

- BARBOUR, T. and G. K. NOBLE  
 1920. Amphibians and reptiles from southern Peru collected by the Peruvian expedition of 1914-1915 under the auspices of Yale University and the National Geographic Society. Proc. U.S. Natl. Mus., 58:609-620.
- BOULENGER, G. A.  
 1885. Catalogue of the lizards in the British Museum (Natural History). 2nd Ed. London, 2:xiii+497 pp.  
 1899. Descriptions of new reptiles and batrachians collected by Mr. P. O. Simons in the Andes of Ecuador. Ann. Mag. Nat. Hist., (7) 4:454-457.  
 1900. Descriptions of new batrachians and reptiles collected by Mr. P. O. Simons in Peru. *Ibid.*, (7) 6:181-186.  
 1901. Further descriptions of new reptiles collected by Mr. P. O. Simons in Peru and Bolivia. *Ibid.*, (7) 7:546-549.  
 1911. Descriptions of new reptiles from the Andes of South America, preserved in the British Museum. *Ibid.*, (8) 7:19-25.
- BURT, C. E. and M. D. BURT  
 1930. The South American lizards in the collection of the United States National Museum. Proc. U.S. Natl. Mus., 78(6):1-52.
- D'ORBIGNY, A. D.  
 1837. 350-353, 356-359 pp. In Duméril, A. M. C. and G. Bibron, 1837. Erpetologie générale. Vol. 4, 572 pp.
- DUMÉRIIL, A. M. C. and G. BIBRON  
 1837. Erpetologie générale. Vol. 4, 572 pp.
- DUMÉRIIL, M. A.  
 1851. Catalogue methodique de la collection des reptiles. Museum D'Histoire Naturelle de Paris. Liv. 1, 128 pp.
- ETHERIDGE, R. E.  
 1970. *Stenocercus*. pp. 254-257. In Peters, J. A. and R. Donoso-Barros, Catalogue of neotropical Squamata: Part II. Lizards and amphisbaenians. Bull. Smithsonian Inst., 297:1-293.
- GIRARD, C.  
 1857. Descriptions of some new reptiles collected by the United States exploring expedition, under the command of Capt. Charles Wilkes, U.S.N. Fourth part including the species of saurians exotic to North America. Proc. Acad. Nat. Sci. Philadelphia, 1857:195-198.
- GUARDIA MAYORGA, C.  
 1967. Diccionario Kechwa-Castellano, Castellano-Kechwa. Editora Los Andes, Lima, Perú. 219 pp.
- MERTENS, R.  
 1952. Amphibien und Reptilien I. pp. 257-266. In Titschack, E. Beitrage zur Fauna Perus. Verlag Gustav Fischer, Jena. Bd. III.
- NOBLE, G. K.  
 1924. New lizards from northwestern Peru. Occas. Papers Boston Soc. Nat. Hist., 5:107-113.
- PARKER, H. W.  
 1934. Reptiles and amphibians from southern Ecuador. Ann. Mag. Nat. Hist., (10) 14:264-273.
- SOKAL, R. R. and F. J. ROHLF  
 1969. Biometry. W. H. Freeman and Company, San Francisco. 776 pp.
- STEJNEGER, L.  
 1913. Results of the Yale Peruvian expedition of 1911. Batracians and reptiles. Proc. U.S. Natl. Mus., 45:541-547.



TSCHUDI, J. J.

1845. Reptilium conspectum quae in republica Peruana reperiuntur et pleraque observata vel collecta sunt in itinere. Arch. Naturg., 11 (1):150-170.

WERNER, F.

1901. Ueber Reptilien und Batrachier aus Ecuador und Neu-Guinea. Verh. Zool.-Bot. Gesell. Wien, 51:593-614.





