

Two new species of *Euspondylus* (Squamata: Gymnophthalmidae) from Peru

GUNTHER KÖHLER

Zusammenfassung

Zwei neue Arten von *Euspondylus* (Squamata: Gymnophthalmidae) aus Peru.

Die Taxonomie der Gattungen *Proctoporus* und *Euspondylus* war schon immer problematisch, vor allem, weil die postulierten Unterschiede gering und zum Teil nicht stabil sind. Ich beschreibe zwei neue Arten der Gattung *Euspondylus* aus Peru. Die eine neue Art (aus dem Departamento Junín, ein Fundort in etwa 2880 m NN) unterscheidet sich von allen anderen *Euspondylus*-Arten durch drei Supraocularia (bei den anderen Arten sind vier Supraocularia vorhanden), von denen das vorderste mit dem vordersten Superciliare verschmolzen ist (bei den anderen Arten ist diese Schuppe distinkt oder verschmolzen). Die neue Art unterscheidet sich weiterhin von *E. spinalis* und *E. rahmi*, denen sie äußerlich am meisten ähnelt, durch eine Längszahl Rückenschuppen von 29-35 (39-54 bei *E. spinalis* und *E. rahmi*), 15-19 Subdigitallamellen der 4. Zehe (20-24 bei *E. spinalis* und *E. rahmi*), das Fehlen von seitlichen Augenflecken (bei *E. spinalis* und *E. rahmi* in der Regel vorhanden) und keine Reduktion der Schuppengröße oberhalb des Längsbandes granularer Schuppen an den Körperseiten (eine solche Reduktion vorhanden bei *E. spinalis* und *E. rahmi*). Die andere neue Art (mehrere Fundorte in 2780-2850 m NN aus dem Departamento Cuzco) unterscheidet sich von *E. spinalis* und *E. rahmi*, denen sie äußerlich am meisten ähnelt, durch folgende Merkmale: *E. rahmi*: Längszahl Rückenschuppen von 41-48 (49-54 bei *E. rahmi*), Männchen mit 7-9 Femoralporen pro Seite (10-11 bei *E. rahmi*), maximale KRL 82 mm (71 mm bei *E. rahmi*) und das Fehlen von seitlichen Augenflecken (bei *E. rahmi* vorhanden). *E. spinalis*: Angelegte Beine überlappen mehr als zehn Rückenschuppenreihen (weniger als 10 bei *E. spinalis*), Weibchen mit 6-9 Femoralporen pro Seite (1-6 bei *E. spinalis*), Supracaudalschuppen bei kleineren Exemplaren (SVL < 70 mm) stark gekielt (diese Schuppen glatt oder nur undeutlich gekielt bei *E. spinalis*), Rücken einfarbig schwärzlich olivbraun (mit einem hellen, dunkel begrenzten Längsband auf der Oberseite von Hals und Rücken bei *E. spinalis*) und ohne seitliche Augenflecken (bei *E. spinalis* meist vorhanden). Es werden weitere Beschuppungs-, Körperproportions- und Färbungsmerkmale aufgeführt, durch die sich die beiden neuen Arten von den einzelnen anderen Arten der Gattungen *Proctoporus* und *Euspondylus* unterscheiden. Ein Bestimmungsschlüssel für die *Euspondylus*-Arten aus Peru wurde erarbeitet.

Schlagwörter: Squamata: Gymnophthalmidae: *Euspondylus*, neue Arten; Peru.

Abstract

I describe two new species of the genus *Euspondylus* from Peru. The new species are distinguished from all species presently assigned to the genera *Euspondylus* and *Proctoporus* by unique characteristics of scalation, morphometrics, and color pattern. A key to the Peruvian species of *Euspondylus* is provided.

Key words: Squamata: Gymnophthalmidae: *Euspondylus*, new species; Peru.

1 Introduction

The taxonomy of the genera *Proctoporus* and *Euspondylus* has always been problematical, both in respect of generic diagnoses and species compositions. Traditionally, the two genera have been separated morphologically from each other by the presence (= *Euspondylus*) versus absence (= *Proctoporus*) of prefrontal scales, and from other genera by the absence of features that are diagnostic of other genera (PETERS & DONOSO-BARROS 1970, KIZIRIAN & COLOMA 1991, KIZIRIAN 1996). However, as documented by KÖHLER & LEHR (unpublished data, manuscript submitted), the prefrontal character is

variable in some populations of *Euspondylus spinalis* (BOULENGER, 1911), and therefore appears to be a weak basis to justify the separation of these genera. Despite the obvious problems in finding characters to differentiate *Euspondylus* from *Proctoporus*, KÖHLER & LEHR (unpublished data, manuscript submitted) decided to keep the two genera separate until more is known about the phylogenetic relationships of the species under consideration. KÖHLER & LEHR (unpublished data, manuscript submitted) describe a new species of *Euspondylus* (called *Euspondylus* species A in the present work), thereby raising the recognized number of Peruvian species of this genus to six: *Euspondylus guentheri* (O'SHAUGHNESSY, 1881), *E. maculatus* TSCHUDI, 1845, *E. rahmi* (DE GRIJS, 1936), *E. simonsii* BOULENGER, 1901, *E. spinalis*, and *Euspondylus* species A.

Evaluation of a series of *Euspondylus spinalis*-like lizards from southern Peru (Departamento de Cuzco) in the collection of the United States National Museum (USNM), Washington, D.C., demonstrated that this material represents an undescribed species. Another apparently undescribed species of *Euspondylus* from central Peru (Departamento de Junín) was discovered in the collection of the Museum of Comparative Zoology, Harvard University (MCZ), Cambridge. I allocate these two new species to *Euspondylus* as a matter of convenience, appreciating that their proper generic allocation must await a phylogenetic analysis of the species that are currently grouped in *Proctoporus* and *Euspondylus*.

2 Materials and Methods

The format for the description of the new species generally follows that of KIZIRIAN (1996) with the addition of several characters that appear to be of taxonomic value such as the number of scales around midbody and some morphometric ratios. Data for Ecuadorian species of *Proctoporus* were taken from KIZIRIAN (1996). Data for the species of the *Proctoporus luctuosus* group were taken from UZZELL (1958). Nomenclature of scale characters follows that of KIZIRIAN (1996). Scale sizes were measured using calipers and were rounded to the nearest 0.1 mm. Thus, millimeters are not repeated following each measurement in the description. For characters recorded on both sides, the condition on the right side is presented first. In specimens that do not have a small distinct anterior supraocular scale but rather a large scale occupying the combined area of the anteriormost superciliary and the anteriormost supraocular, I have considered this to be a fusion of these two scales. This condition has been interpreted to be the first superciliary expanded onto the dorsal surface of the head by UZZELL (1970). Drawings were made with stereomicroscope with drawing tube attachment. A list of the specimens examined for comparison with the new species is provided in the Appendix. Abbreviations for museum collections follow those of LEVITON et al. (1985), except MHNSM (Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru).

3 Systematics

Euspondylus josyi sp. nov.

Holotype: MCZ 85787 (Figs. 1, 2), an adult male, Peru, Departamento Junín, Marainiyoc, 11°22'S, 75°24'W, 2880 m elevation, collected by J.A. GRISWOLD, 6 March - 13 May 1939.

Paratypes: MCZ 45894, 85778-80, 85782, 85784, 85795, 85797, 85805, 85807, 85810-11, 85813, 85823-24, 85828, 85830, 85832, 85840, 85843-44, 85851, 85856,

85862, 85864-65, 85867, 85869, 85874, 85878, 85880-81, 85885, 85892-93, 85907, 85911, SMF 81796-97, USNM 217487, all with the same collecting data as holotype.

Diagnosis: (1) Internasal length slightly less than frontal length; (2) nasoloreal suture present or absent; (3) supraoculars three (exceptionally four), anteriormost supraocular fused with anteriormost superciliary, all supraoculars separated from ciliaries by superciliaries; (4) superciliary series complete, four scales, anteriormost superciliary fused with anteriormost supraocular; (5) supralabial-subocular fusion absent; (6) postoculars three or four; (7) postparietals three or four, usually three; (8) supratympanic temporals two or three, usually three; (9) genials two, transverse sutures perpendicular with respect to midline of body; (10) dorsal scales rectangular, juxtaposed, keeled; (11) transverse dorsal count 17-21 in both sexes; (12) longitudinal dorsal count 29-35 in both sexes; (13) longitudinal ventral count 16-19 in both sexes; (14) a lateral band of 2-3 rows, usually two rows of tiny scales, dorsal scales above this band not reduced in size; (15) femoral pores in males 6-8, in females 1-4; 6 scales between femoral pores; (16) subdigital scales on 4th finger 11-13, on 4th toe 15-19; (17) limbs overlapping when adpressed against body in adults (by a distance equal to 1-7 dorsal scales); (18) anterior preanal plate scales paired; (19) hemipenis morphology unknown; (20) dorsum uniform dark olive brown; small lateral ocelli absent; ventral surfaces grayish olive brown; (21) lower palpebral disc an unsectioned oval; (22) prefrontals present.

Euspondylus josyi can be distinguished from all species currently assigned to *Euspondylus* by having three supraoculars (only exceptionally four), the anteriormost one fused with the anteriormost superciliary (four supraoculars in all other species of *Euspondylus*, the anteriormost one fused or not). It can be further differentiated from its congeners by the following characteristics (condition for *E. josyi* in parentheses): *E. maculatus* and *E. guentheri*: lower palpebral disc with vertical sections (palpebral disc an unsectioned oval) and dorsal scales smooth or wrinkled (keeled). *E. rahmi* and *E. spinalis*: longitudinal dorsal count 39-54 (29-35); subdigital lamellae of fourth toe 20-24 (15-19); lateral ocelli usually present (absent); dorsal scales reduced in size above longitudinal band of lateral granules (not reduced in size). *E. simonsii*: a pale line between tympanum and shoulder present (absent); a pale vertebral stripe usually present (absent); dorsal scales smooth or only faintly keeled on posterior dorsum (all dorsal scales keeled). *Euspondylus* species A: femoral pores (one side) 12-15 in males, 12-14 in females (6-8 in males, 1-4 in females), a dorsolateral dark bordered pale stripe on neck and body and usually a less distinct lateral dark bordered pale stripe on neck and anterior body (these stripes not present). It can be distinguished from all species currently placed in the genus *Proctoporus* by the presence of prefrontals (absent in the species of *Proctoporus*).

Description of the holotype: Adult male; SVL 59.0, tail (incomplete, at least 50 percent missing) length 30; axilla to groin distance 28.8; head length 13.2; head width 10.4; shank length 6.6.

Head scales smooth, glossy; rostral scale wider (2.4) than long (1.3), higher than adjacent supralabials, in contact with frontonasal, nasoloreal, and first supralabials posteriorly; frontonasal narrower (2.2) than long (2.4), widest posteriorly, in contact with nasoloreal and frenocular laterally, prefrontals posteriorly; an oblique nasoloreal suture present; prefrontals present (width 1.5, length 1.8), in contact with each other medially, in contact with fused anteriormost superciliary-anteriormost supraocular,

frontal posteriorly; frontal longer (2.8) than wide (2.3), widest anteriorly, anterior suture angular with point directed anteriorly, posterior suture angular with point directed posteriorly, in contact with second supraocular laterally, frontoparietals posteriorly; frontoparietals hexagonal, in contact with third supraocular, parietals and interparietal posteriorly; supraoculars three, none in contact with ciliaries; superciliary series complete, anteriormost superciliary fused with anteriormost supraocular; palpebral disc an unsectioned oval, unpigmented; frenocular quadrangular, height 1.6, length 1.2, in contact with nasoloreal anteriorly; postoculars $4/3$; interparietal subheptagonal, longer (4.8) than wide (1.9), in contact with parietals laterally, postparietals posteriorly; parietals subpentagonal, in contact with third supraocular anterolaterally, temporal scales laterally, dorsalmost postocular, postparietals posteriorly; postparietals four, outer ones largest; temporals polygonal; supratympanic temporals $3/2$; supralabials seven; infralabials five to level of smallest supralabial; mental wider (2.6) than long (1.4), in contact with first infralabials, postmental posteriorly; postmental single, pentagonal, posterior suture angular, point directed posteriorly, in contact with first and second infralabials; genials in two pairs, anterior pair subquadrangular, in contact with second and third infralabials; posterior genials subpentangular, in contact with third and fourth infralabials laterally; scale rows between genials and collar fold (along midventral line) 10; medialmost scales of three penultimate gular scale rows slightly enlarged; posteriormost gular row concealing two granular scale rows; lateral neck scales rounded, smooth, nonimbricate. Dorsal scales rectangular, longer than wide, juxtaposed, keeled, 33 in a longitudinal count; some middorsal scales irregularly arranged; transverse dorsal count at fifth transverse ventral scale row 19, at 10th transverse ventral scale row 19, at 15th transverse ventral scale row 13; lateral scale rows at fifth transverse ventral scale row three, at 10th transverse ventral scale row two, at 15th transverse ventral scale row 6; lateral scales on body near insertion of forelimb small to granular; longitudinal ventral count 18; transverse ventral count at midbody 10; 33 scales around midbody; anterior preanal plate scales two; posterior preanal plate scales four, all about same size; scales on tail rectangular and juxtaposed, keeled; midventral subcaudals squarish.



Fig. 1. Holotype of
von *Euspondylus*
josyi (MCZ 85787),
SVL 59.0 mm.

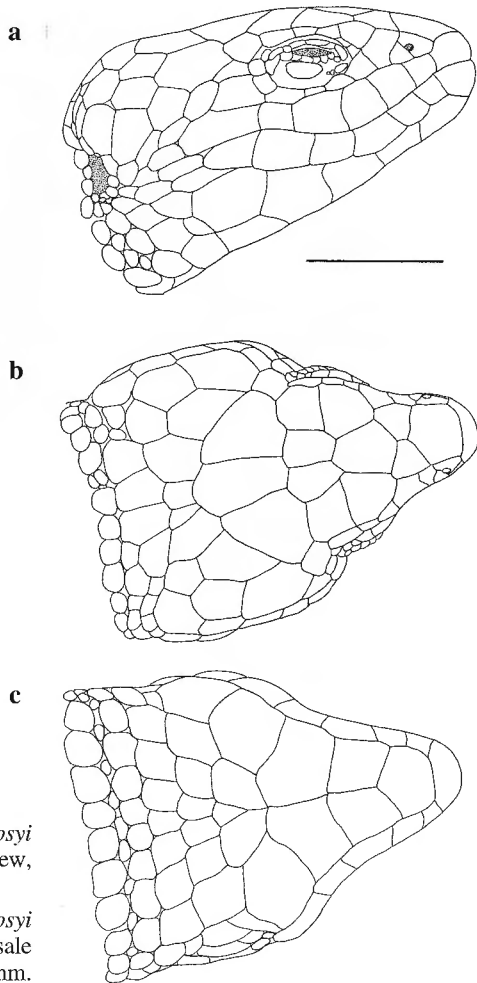


Fig. 2. Head of holotype of *Euspondylus josyi* (MCZ 85787). (a) lateral view, (b) dorsal view, (c) ventral view. Scale bar = 5.0 mm.

Kopf des Holotypus von *Euspondylus josyi* (MCZ 85787). (a) seitliche Ansicht, (b) dorsale Ansicht, (c) ventrale Ansicht. Balken = 5,0 mm.

Limbs pentadactyl; digits clawed; forelimb reaching anteriorly to sixth supralabial; dorsal brachial scales polygonal, of varying sizes, subimbricate, smooth; midbrachial anterodorsal scales at least twice as large as adjacent scales, smooth; anteroventral, ventral, and posteroventral scales roundish, nonimbricate, smooth; antibrachial scales polygonal, of various sizes; medial antibrachial scales small, rounded, smooth; dorsal manus scales polygonal, subimbricate; palmar scales small, oval, domelike; dorsal scales on fingers smooth, quadrangular, covering dorsal half of digit, three on I, six on II, eight on III, eight on IV, five on V; subdigital scales five on I, nine on II, 12 on III, 12/11 on IV, eight on V; anterodorsal thigh scales polygonal, at least twice as large as adjacent scales, becoming smaller ventrally, smooth; posterodorsal thigh scales granular, smooth; seven femoral pores per side; six scales between medialmost femoral pores; anterior and anteromedial shank scales polygonal, subimbricate,

		<i>E. josyi</i>	<i>E. caideni</i>
Max. SVL (mm)	males	62.0	82.0
	females	55.0	71.0
Tail length / SVL	males	1.2–1.4 (1.34 ± 0.11)	–
	females	1.2–1.4 (1.31 ± 0.07)	–
Head length / head width	males	1.23–1.49 (1.37 ± 0.07)	1.37–1.61 (1.46 ± 0.07)
	females	1.30–1.53 (1.42 ± 0.06)	1.55–1.57 (1.56 ± 0.01)
Shank length / SVL	males	0.10–0.17 (0.12 ± 0.01)	0.12–0.16 (0.14 ± 0.01)
	females	0.10–0.13 (0.11 ± 0.01)	0.11–0.13 (0.12 ± 0.01)
Degree of limb overlap		1–7 (2.9 ± 1.59)	10–13 (11.1 ± 1.05)
Number of femoral pores	males	6–8 (6.7 ± 0.50)	7–9 (8.4 ± 0.41)
	females	1–4 (2.4 ± 0.66)	6–9 (7.5 ± 1.00)
Number of genials		2 (2.0 ± 0.0)	2 (2.0 ± 0.0)
Number of postparietals		3–4 (3.1 ± 0.26)	3 (3.0 ± 0.0)
Number of supra-tympanic temporals		2–3 (2.9 ± 0.26)	3–4 (3.1 ± 0.27)
Number of scales around midbody		31–37 (33.3 ± 1.22)	39–46 (42.3 ± 1.97)
Longitudinal dorsal count		29–35 (32.2 ± 1.40)	41–48 (43.9 ± 2.00)
Number of longitudinal ventral scale rows		10 (10.0 ± 0.0)	12 (12.0 ± 0.0)
Number of transverse ventral scale rows		16–19 (17.7 ± 0.88)	20–22 (20.8 ± 0.58)
Lamellae under 4th finger		11–13 (11.8 ± 0.67)	15–18 (16.9 ± 0.86)
Lamellae under 4th toe		15–19 (17.3 ± 0.92)	22–24 (22.8 ± 0.77)

Tab. 1. Comparison of morphometric and pholidosis characters in *Euspondylus josyi* (20 males, 20 females) and *E. caideni* (13 males, 2 females); range is followed by mean value and one standard deviation in parentheses. In the character "Degree of limb overlap" the number denotes the number of dorsal scales covered by the overlapping distal parts of the limbs.

Vergleich von morphometrischen und pholidotischen Merkmalen bei *Euspondylus josyi* (20 Männchen, 20 Weibchen) und *E. caideni* (13 Männchen, 2 Weibchen); Variationsbreite, gefolgt von Mittelwert und Standardabweichung, in Klammern. Bei dem Merkmal „Degree of limb overlap“ gibt der Wert an, wie viele Rückenschuppenreihen von den überlappenden Extremitäten bedeckt werden.

smooth, anterioventral scales several times larger than lateral, posterolateral, and posteromedial shank scales; lateral, posterolateral, and posteromedial shank scales polygonal or roundish, juxtaposed, faintly keeled; dorsal pes scales polygonal, subimbricate, smooth; scales on dorsal surface of digits single, quadrangular, smooth, overhanging subdigital scales, three on I, six on II, eight on III, 8/11 on IV, seven on V; subdigital scales single or double, six on I, 10/9 on II, 14 on III, 18/17 on IV, 12 on V.

Coloration in preservative (70 % ethanol): Dorsal and lateral surfaces of head, body, tail and limbs uniform dark olive brown, without lateral ocelli; ventral head grayish olive brown with cream mottling; ventral scales mostly grayish olive brown, posterior

portion of medial ones cream colored; ventral surfaces of limbs grayish olive brown; ventral surface of tail cream with grayish olive brown mottling.

Variation: All specimens in the type series have uniform dark olive brown dorsal and lateral surfaces of head, body, tail and limbs without lateral ocelli which does not

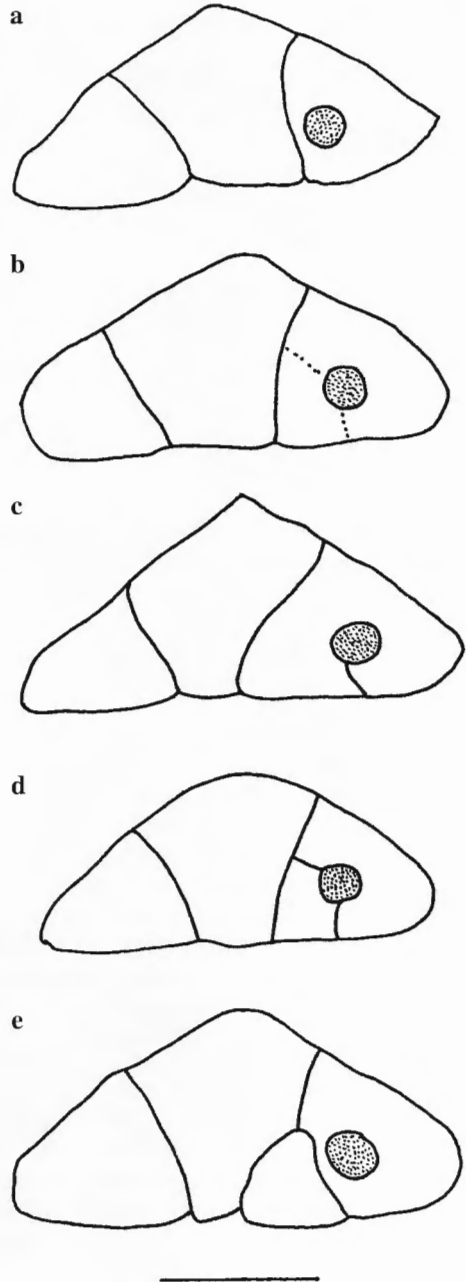


Fig. 3. Variation in the nasoloreal region in *Euspondylus josyi*: (a) MCZ 85823; (b) MCZ 45982; (c) MCZ 85807; (d) MCZ 45893; (e) MCZ 85811. The frequency distribution of these five conditions among the type series is (a) 22.0 %, (b) 5.0 %, (c) 5.0 %, (d) 24.2 %, and (e) 43.8 %. Scale bar = 1.0 mm.

Variation in der Nasolorealregion bei *Euspondylus josyi*: (a) MCZ 85823; (b) MCZ 45982; (c) MCZ 85807; (d) MCZ 45893; (e) MCZ 85811. Die Häufigkeitsverteilung dieser fünf Ausprägungen in der Typenserie ist (a) 22,0 %, (b) 5,0 %, (c) 5,0 %, (d) 24,2 % und (e) 43,8 %. Balken = 1,0 mm.

appear to be an artifact of preservation. Only one (MCZ 85878) out of 50 specimens examined has four instead of three supraoculars. The anteriormost supraocular is fused with the anteriormost superciliary in all specimens. Considerable variation is apparent in the nasoloreal region (Fig. 3). Ontogenetic variation in respect of scalation is not apparent. The relative tail length of the juveniles (SVL 24.0-31.0 mm) is 1.13-1.36 (mean = 1.26; SD = 0.082). See Table 1 for variation in selected morphometric and squamation characters in the type series.

Etymology: The species name *josyi* is a patronym for FRANZ-JOSEF HANS, nickname JOSY, Germany, in recognition of his support of taxonomic studies through the BIOPAT programme.

Distribution: *Euspondylus josyi* is known only from the type locality, the town Marainiyoc, at 2880 m elevation.

Other referred specimens: MCZ 85954-55, 85971, 85985, 85989, 85998, 86002, 86010, 86016-17, all juveniles, with the same data as holotype.

Euspondylus caideni sp. nov.

Holotype: USNM 60664 (Figs. 4, 5), an adult male, Peru, Departamento Cuzco, Río Occobamba [= Ocobamba] valley, Tocopqueyu, ca. 12°53'N, 72°21'W, 2780 m, collected by E. HELLER on 25 July 1915.

Paratypes: MCZ 12405, 12408, SMF 81844-45, USNM 60666-72 same collecting data as holotype; USNM 60729-30 Peru, Departamento Cuzco, Ollantaytambo, 2850 m, 13°16'N, 72°16'W, collected by E. HELLER on 14 July 1915; USNM 60745 Río Cosireni, 12°33'N, 73°04'W, collected by E. HELLER during the National Geographic Peruvian Expedition of 1914-1915. Most paratypes are males, except for USNM 60668 and MCZ 12408 (females).

Diagnosis: (1) Internasal length slightly less than frontal length; (2) nasoloreal suture present or absent; (3) supraoculars four, anteriormost supraocular fused with anteriormost superciliary or not, all supraoculars separated from ciliaries by superciliaries; (4) superciliary series complete, three or four scales (exceptionally five scales), anteriormost superciliary fused with anteriormost supraocular or not; (5) supralabial-subocular fusion absent; (6) postoculars three or four; (7) postparietals three; (8) supratympanic temporals three or four, usually three; (9) genials two, transverse sutures perpendicular with respect to midline of body; (10) dorsal scales subhexagonal with rounded posterior margins, juxtaposed, keeled; (11) transverse dorsal count 16-20 in both sexes; (12) longitudinal dorsal count 41-48 in both sexes; (13) longitudinal ventral count 20-22 in both sexes; (14) a lateral band of 2-3 rows of tiny scales, dorsal scales above this band reduced in size; (15) femoral pores in males 7-9, in females 6-9; 6 scales between femoral pores; (16) subdigital scales on 4th finger 15-18, on 4th toe 22-24; (17) limbs overlapping when adpressed against body in adults (by a distance equal to 10-13 dorsal scale rows); (18) anterior preanal plate scales paired; (19) hemipenis morphology unknown; (20) dorsum uniform blackish olive brown; small lateral ocelli absent; ventral surfaces blackish olive brown; (21) lower palpebral disc an unsectioned oval; (22) prefrontals usually present.

Euspondylus caideni can be distinguished from all species currently assigned to *Euspondylus* by the following characteristics (condition for *E. caideni* in parentheses): *E. maculatus* and *E. guentheri*: lower palpebral disc with vertical sections (palpebral disc an unsectioned oval) and dorsal scales smooth or wrinkled (keeled). *E. simonsii*: a pale line between tympanum and shoulder present (absent); a pale vertebral stripe usually present (absent); dorsal scales smooth or only faintly keeled on posterior dorsum (all dorsal scales keeled). *E. josyi*: longitudinal dorsal count 29-35 (41-48); subdigital lamellae of fourth toe 15-19 (22-24); dorsal scales not reduced in size above longitudinal band of lateral granules (reduced in size); and three supraoculars, exceptionally four (four supraoculars). *E. rahmi*: longitudinal dorsal count 49-54 (41-48); femoral pores (one side) 10-11 in males (7-9 in males); maximum SVL 71 mm (82 mm); and numerous lateral ocelli present (absent). *E. spinalis*: femoral pores (one side) 7-11 in males, 1-6 in females (7-9 in males, 6-9 in females); adpressed limbs overlapping by fewer than 10 dorsal scale rows (10 or more); supracaudal scales only faintly keeled or smooth (strongly keeled in smaller [SVL < 70 mm] individuals, only faintly keeled or smooth in very large individuals); dorsum usually with a broad dark bordered pale vertebral band on neck and body (dorsum uniform blackish olive brown without a broad dark bordered pale vertebral band); and lateral ocelli usually present (absent). *Euspondylus* species A: femoral pores (one side) 12-15 in males, 12-14 in females (7-9 in males, 6-9 in females); a dorsolateral dark bordered pale stripe on neck and body; and usually a less distinct lateral dark bordered pale stripe on neck and anterior body (these stripes not present). It can be distinguished from all species currently placed in the genus *Proctoporus* by the presence of prefrontals (absent in the species of *Proctoporus*).

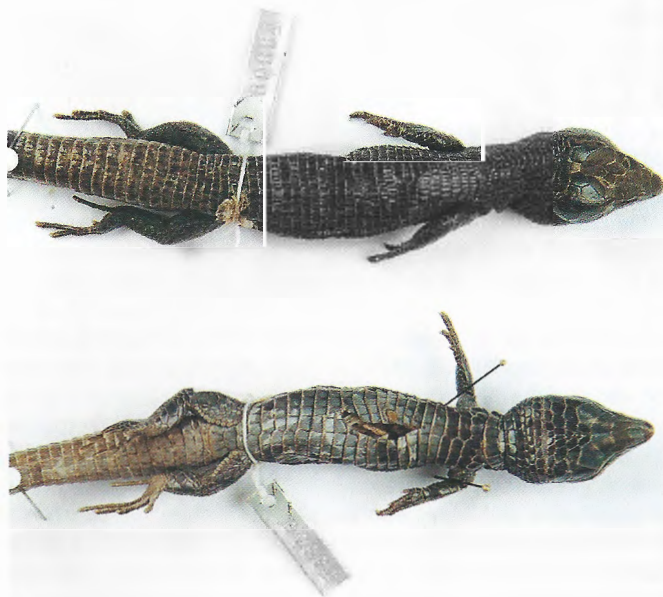


Fig. 4. Holotype of von *Euspondylus caideni* (USNM 60664), SVL 82.0 mm.

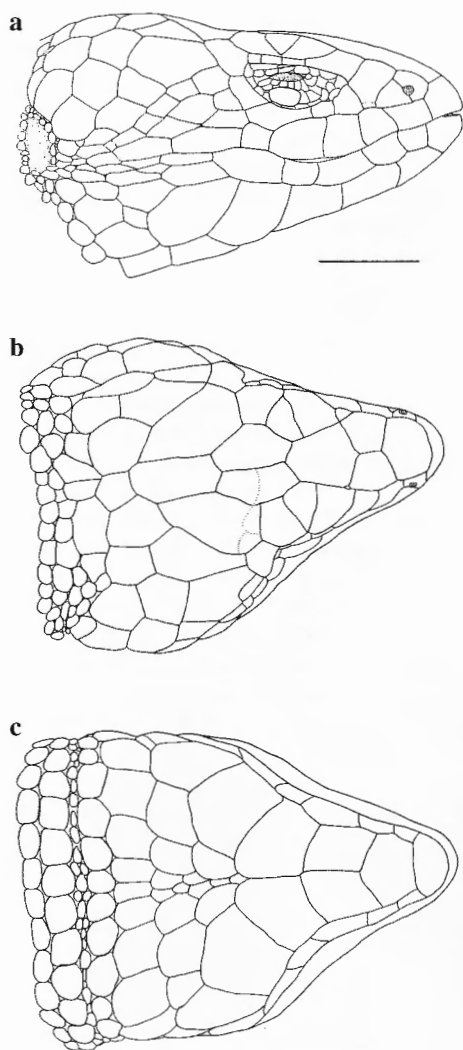


Fig. 5. Head of holotype of *Euspondylus caideni* (USNM 60664). (a) lateral view, (b) dorsal view, (c) ventral view. Scale bar = 5.0 mm.

Kopf des Holotypus von *Euspondylus caideni* (USNM 60664). (a) seitliche Ansicht, (b) dorsale Ansicht, (c) ventrale Ansicht. Balken = 5,0 mm.

Description of the holotype: Adult male; SVL 82.0, tail (incomplete, distal 29.5 regenerated) length 99.5; axilla to groin distance 39.1; head length 20.1; head width 14.7; shank length 10.0.

Head scales smooth, glossy; rostral scale wider (3.0) than long (1.9), higher than adjacent supralabials, in contact with frontonasal, nasoloreal, and first supralabials posteriorly; frontonasal about as wide (3.1) as long (3.2), widest posteriorly, in contact with nasoloreal and frenocular laterally, prefrontals posteriorly; an oblique nasoloreal suture present; prefrontals present (width 2.1, length 2.8), in contact with each other medially, in contact with anteriormost superciliary and anteriormost supraocular (these scales fused on right side), frontal posteriorly; frontal longer (4.1) than wide (3.4), widest anteriorly, anterior suture angular with point directed anteriorly, posterior

suture angular with point directed posteriorly, in contact with second and third supraocular laterally (narrowly contacting anteriormost supraocular on left side), frontoparietals posteriorly; frontoparietals hexagonal, in contact with third and fourth supraocular, parietals and interparietal posteriorly; supraoculars four, none in contact with ciliaries; superciliary series complete; palpebral disc an unsectioned oval, unpigmented; frenocular subrectangular, height 2.5, length 1.6, in contact with nasoloreal anteriorly; postoculars three; interparietal heptagonal, longer (4.9) than wide (2.2), in contact with parietals laterally, postparietals posteriorly; parietals subheptagonal, in contact with fourth supraocular anterolaterally, temporal scales laterally, dorsalmost postocular, postparietals posteriorly; postparietals three, outer ones largest; temporals polygonal; supratympanic temporals three; supralabials seven; infralabials five to level of smallest supralabial; mental wider (3.1) than long (1.9), in contact with first infralabials, postmental posteriorly; postmental single, subheptagonal, posterior suture angular, point directed posteriorly, in contact with first and second infralabials; genials in two pairs, anterior pair subquadrangular, in contact with second and third infralabials; posterior genials pentagonal, in contact with third and fourth infralabials laterally; scale rows between genials and collar fold (along midventral line) 11; medialmost scales of three penultimate gular scale rows slightly enlarged; posteriormost gular row concealing two granular scale rows; lateral neck scales rounded, smooth, nonimbricate; an antehumeral fold well developed. Dorsal scales subhexagonal with rounded posterior margins, longer than wide, juxtaposed, keeled, 48 in a longitudinal count; some middorsal scales irregularly arranged; transverse dorsal count at fifth transverse ventral scale row 15, at 10th transverse ventral scale row 18, at 15th transverse ventral scale row 16; lateral scale rows at fifth transverse ventral scale row 13, at 10th transverse ventral scale row eight, at 15th transverse ventral scale row 11; lateral scales on body near insertion of forelimb granular; longitudinal ventral count 21; transverse ventral count at midbody 12; 46 scales around midbody; anterior preanal plate scales two; posterior preanal plate scales four, all about same size; scales on tail rectangular and juxtaposed, smooth to wrinkled; midventral subcaudals squarish.

Limbs pentadactyl; digits clawed; forelimb reaching anteriorly to fifth supralabial; dorsal brachial scales polygonal, of varying sizes, subimbricate, smooth; midbrachial anterodorsal scales at least twice as large as adjacent scales, smooth; anteroventral scales flat, subimbricate; ventral and posteroventral scales roundish, nonimbricate, smooth; antebrachial scales polygonal, of various sizes, subimbricate; medial antebrachial scales small, rounded, smooth; dorsal manus scales polygonal, subimbricate; palmar scales small, oval, smooth; dorsal scales on fingers smooth, quadrangular, covering dorsal half of digit, overhanging subdigital scales, three on I, six on II, eight on III, nine on IV, six on V; subdigital scales six on I, 11 on II, 15 on III, 17/18 on IV, 10 on V; anterodorsal thigh scales polygonal, at least twice as large as adjacent scales, becoming smaller ventrally, smooth; posterodorsal thigh scales granular, smooth; anterior and anteromedial shank scales polygonal, subimbricate, smooth; anteroventral scales several times larger than lateral, posterolateral, and posteromedial shank scales; lateral, posterolateral, and posteromedial shank scales polygonal or roundish, juxtaposed, some anterodorsal scales faintly keeled; dorsal pes scales polygonal, subimbricate, smooth; scales on dorsal surface of digits single, quadrangular, smooth, overhanging subdigital scales, four on I, six on II, nine on III, 13 on IV, nine on V; subdigital scales single or double, six on I, 12 on II, 17/16 on III, 23 on IV, 14 on V; 9/8 femoral pores per side; six scales between medialmost femoral pores.

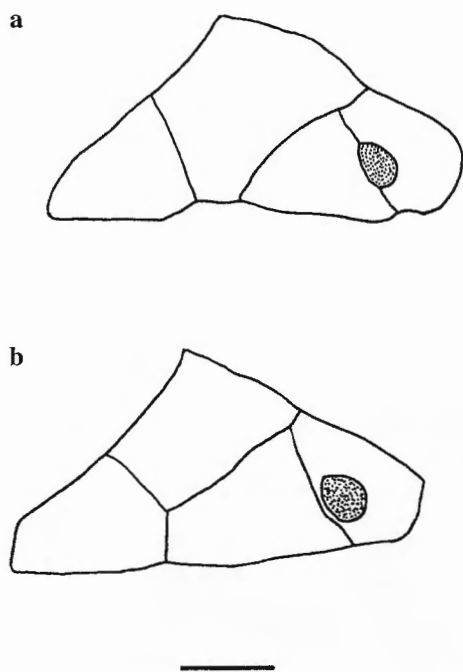


Fig. 6. Variation in the nasoloreal region in *Euspondylus caideni*: (a) USNM 60730; (b) USNM 60745. The frequency distribution of these two conditions among the type series is (a) 13.3 %, (b) 86.7 %. Scale bar = 1.0 mm.

Variation in der Nasolorealregion bei *Euspondylus caideni*: (a) USNM 60730; (b) USNM 60745. Die Häufigkeitsverteilung dieser fünf Ausprägungen in der Typenserie ist (a) 25,0 %, (b) 75,0 %. Balken = 1,0 mm.

Coloration in preservative (70 % ethanol): Dorsal, lateral, and ventral surfaces of head, body, and limbs uniform blackish olive brown, without lateral ocelli; dorsal surfaces of tail olive brown with diffuse yellowish brown mottling; ventral surfaces of tail grayish olive brown.

Variation: All specimens of the type series agree in coloration with the holotype. All specimens have four supraoculars. The anteriormost supraocular is fused with the anteriormost superciliary in some specimens while in others these scales are distinct; and three specimens (SMF 81845, USNM 60664, 60666) have these scales fused on one side but distinct on the other. Considerable variation is apparent in the scalation of the nasoloreal region (Fig. 6). In USNM 60668, the prefrontals are fused to the frontal scale, whereas in the other specimens, the prefrontals are distinct. See Table 1 for variation in selected morphometric and squamation characters in the type series.

Etymology: The species name *caideni* is a patronym for CAIDEN VLASIMSKY, U.S.A., in recognition of his support of taxonomic studies through the BIOPAT programme.

Distribution and habitat: *Euspondylus caideni* is known from 2780 to 2850 m elevation. The region of Tocopqueyu (2780 m elevation) is reported to represent a "humid, temperate zone where forest meets grassy uplands" whereas the vicinity of Ollantaytambo (2850 m elevation) is an "arid, temperate zone, [with] cactus and

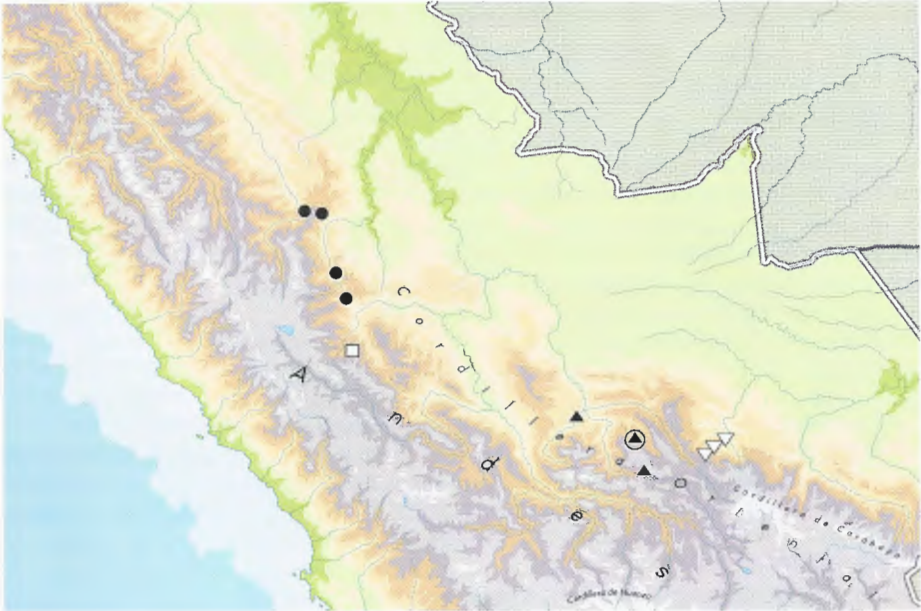


Fig. 7. Distribution of the Peruvian species of *Euspondylus* with keeled dorsal scales and an unsectioned lower palpebral disk. *E. josyi* (square), *E. caideni* (solid triangles; type locality encircled), *E. rahmi* (inverted empty triangles), and *E. spinalis* (circles).

Verbreitung der peruanischen Arten von *Euspondylus* mit gekielten Rückenschuppen und ungeteiltem Fenster im unteren Augenlid. *E. josyi* (Quadrat), *E. caideni* (ausgefülltes Dreieck; Terra typica eingekreist), *E. rahmi* (umgekehrtes leeres Dreieck) und *E. spinalis* (Kreise).

stunted bushes, grasses above valley” (STEPHENS & TRAYLOR 1983). The Río Cosireni is located in the “humid tropical zone” (STEPHENS & TRAYLOR 1983).

Other referred specimens: Peru, Departamento Cuzco, Río Occobamba [= Ocobamba] valley, Tocoqueyu, ca. 12°53'N, 72°21'W, 2780 m: MCZ 12407 (skeleton).

4 Discussion

The relationships among the species currently assigned to the genera *Euspondylus* and *Proctoporus* remain poorly known. As pointed out by KÖHLER & LEHR (unpublished data, manuscript submitted), the supposedly diagnostic presence versus absence of prefrontal scales is not a reliable basis for the generic assignment of the species under consideration. A comprehensive phylogenetic study of *Euspondylus* and *Proctoporus* is needed as a basis for a new taxonomy of this group of lizards. Therefore, the generic allocation of the two species described in the present work can only be tentatively. The distribution of the Peruvian species of *Euspondylus* with keeled dorsal scales and an unsectioned lower palpebral disk (i.e. *E. josyi*, *E. caideni*, *E. rahmi*, and *E. spinalis*) based on the specimens examined is depicted on Fig. 7.

5 Key to the species of *Euspondylus* from Peru

- 1a. Lower palpebral disc with vertical sections 2
 1b. Lower palpebral disc an unsectioned oval 3
- 2a. Dorsum pale brown with distinct dark brown cross-bars; smallest subocular scale about the same size as smallest supralabial scale ... *Euspondylus guentheri*
 2a. Dorsal pattern without dark brown cross-bars; smallest subocular scale much smaller than smallest supralabial scale *Euspondylus maculatus*
- 3a. Femoral pores (one side) 12-15 (males) and 12-14 (females) *Euspondylus* species A
 3b. Femoral pores (one side) 6-11 (males) and 0-9 (females) 4
- 4a. Dorsal scales smooth or only faintly keeled on posterior dorsum; a light line between tympanum and forelimb *Euspondylus simonsii*
 4b. Dorsal scales keeled; no light line between tympanum and forelimb 5
- 5a. Longitudinal dorsal count 29-35; three supraoculars (exceptionally four), the anteriormost one fused with the anteriormost superciliary; subdigital lamellae of fourth toe 15-19; dorsal scales not reduced in size above the longitudinal band of lateral granules (Fig. 8a) *Euspondylus josyi*
 5b. Longitudinal dorsal count 39-54; four supraoculars, the anteriormost one fused with the anteriormost superciliary or not; subdigital lamellae of fourth toe 20-24; dorsal scales reduced in size above the longitudinal band of lateral granules (Fig. 8b-d) 6
- 6b. Anteriormost supraocular not fused with anteriormost superciliary; longitudinal dorsal count 49-54; sides of body with numerous conspicuous ocelli *Euspondylus rahmi*
- 6a. Anteriormost supraocular fused with anteriormost superciliary or not; longitudinal dorsal count 39-46; sides of body with ocelli or not 7
- 7a. Adpressed limbs overlapping by 10 or more dorsal scale rows; SVL to 82 mm; femoral pores (one side) 7-9 (males) and 6-9 (females); supracaudal scales strongly keeled in smaller (SVL < 70 mm) individuals (only faintly keeled or smooth in very large individuals); body without lateral ocelli; dorsum without a broad dark bordered pale vertebral band on neck and body *Euspondylus caideni*
 7b. Adpressed limbs overlapping by fewer than 10 dorsal scale rows; femoral pores (one side) 7-11 (males) and 1-6 (females); supracaudal scales only faintly keeled or smooth; body usually with lateral ocelli; dorsum usually with a broad dark bordered pale vertebral band on neck and body *Euspondylus spinalis*

Acknowledgments

For the loan of or access to specimens I thank L. FORD and D.R. FROST, American Museum of Natural History (AMNH), New York; C.J. McCARTHY, The Natural History Museum (BMNH), London; A. RESETAR, Field Museum of Natural History (FMNH), J. HANKEN and J.P. ROSADO, Museum of Comparative Zoology, Harvard University (MCZ), Cambridge; Chicago; B. MULHAUSER, Musée d'Histoire naturelle (MHNN), Neuchâtel; J. CORDOVA, Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (MHNSM), Lima; F. TIEDEMANN, Naturhistorisches Museum Wien (NMW), Wien; R.W. MCDIARMID and W.R. HEYER, National Museum of Natural History (USNM), Washington, D.C.; W. BÖHME, Zoologisches Forschungsinstitut und Museum Alexander Koenig (ZFMK), Bonn; F. GLAW and D. FUCHS, Zoologische Staatssammlung München (ZSM), Munich.

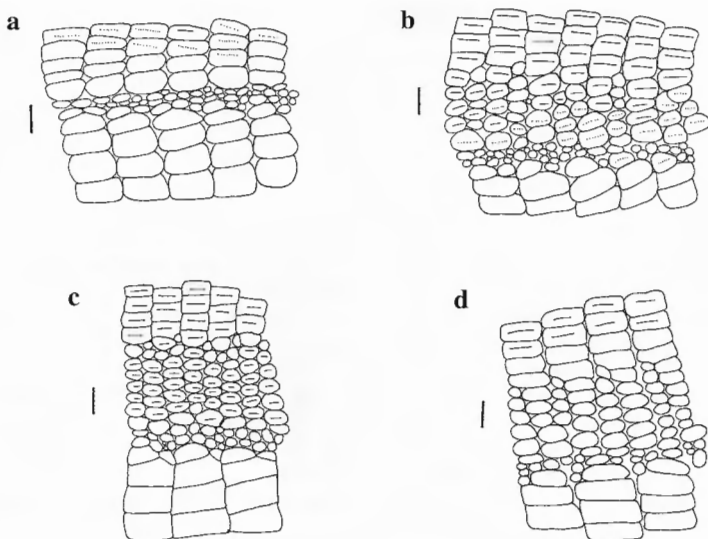


Fig. 8. Lateral scalation at midbody: (a) *Euspondylus josyi* (MCZ 85874); (a) *E. caideni* (USNM 60669); (c) *E. rahmi* (AMNH 142919); (d) *E. spinalis* (AMNH 13477). Note the differences in the size of the scales above the longitudinal band of lateral granules and the different degree in keeling of these scales. Scale bar = 1.0 mm.

Seitliche Beschuppung in Körpermitte: (a) *Euspondylus josyi* (MCZ 85874); (b) *E. caideni* (USNM 60669); (c) *E. rahmi* (AMNH 142919); (d) *E. spinalis* (AMNH 13477). Man beachte die unterschiedliche Größe der Schuppen oberhalb des Längsbandes granulärer Schuppen und die unterschiedliche Kielung dieser Schuppen. Balken = 1,0 mm.

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Appendix: Comparative Material Examined.

- Euspondylus acutirostris*—"Venezuela": ZMB 4597.
- Euspondylus guentheri*—Ecuador: Morona-Santiago: Chiguaza: USNM 196152; Pastaza: Río Licura: USNM 196153; Montalvo: USNM 196154; Don Tomas, 5 km S Montalvo: USNM: 196156; upper Río Curaray: USNM 196155; Santana, 880 m: SMF 81505.
- Euspondylus maculatus*—Peru: Puno: Juliaca, Lake Aracona, 16600 ft: AMNH 1704; San Martín: vicinity of Moyabamba: MHNN 2105 (1-2).
- Euspondylus rahmi*—Peru: Cuzco: Buenos Aires, 53 km SW Pilcopata, on road from Cuzco to Manu: USNM 222378-80; 1-6 km (by road) E Pillahuata (= km 128 - km 133 on Paucartambo - Pilcopata road): USNM 298327-36; 55 km (by road) NE Paucartambo, Quebrada Morro Leguía (= km 137 on Paucartambo-Atalaya road): USNM 346180, 346394; Paucartambo, along road between Paucartambo and Pilcopata, Buenos Aires, between Pillahuata and Pilcopata, 13°7'S, 71° W, 2395 m: AMNH 142919.
- Euspondylus simonsii*—Ecuador: Pastaza: Puyo (btw. Mera and Tena): MCZ 133633; Morono-Santiago: Chiguaza: USNM 229751-52; Pastaza: Río Villano: USNM 287914; Peru: Puntoyacu, Río Perené, ca. 1250 m: BMNH 1946.8.2.3; Huánuco: Cerros del Sira, 9°25'S, 74°44'W, 1560 m: AMNH 104284; Loreto: Río Aguaytia, Cordillera Azul: MCZ 45879; Puno: 11 km (airline) NNE Ollachea: USNM 299028.
- Euspondylus spinalis*—Peru: Huánuco: Palma Pampa (9°53'14''S, 75°53'21''W), 3010 m: MHNSM 20111-15, MTD 41661-64, SMF 80125-28, 80130; ZFMK 76998; Tomayrica (9°55'48''S, 75°54'11''W), 3310 m: MHNSM 20096-99, SMF 80114-17; 15 km W Chinchao on Huánuco - Tingo María road: USNM 167143; Pasco: San Alberto, Oxapampa: AMNH 13481; FMNH 134393-97, MHNSM 17727-28; Huancabamba: AMNH 13477-78, BMNH 1946.8.31.44-50, NMW 19142 (1-12), UMMZ 51280, 58918 (1-3).
- Opipеuter xestus*—Bolivia: Cochabamba: Yungas del Palmar, ZSM 5/1940; Sehuencas, ZFMK 57841-42, 60184; Santa Cruz: Remates, SMF 81841.
- Proctoporus achlyens*—Venezuela: Aragua: Rancho Grande, 1100 m, SMF 55719-23.
- Proctoporus bolivianus*—Without locality data: SMF 81795; Peru: Apurimac: 39 km NE Abancay, ZFMK 44433-37; Cuzco: Río Vilcamata, near Calca (Cuzco region), 3000 m: SMF 81792; Rumikollka, near Cuzco, ca. 3500 m: SMF 81793; Rumikollka, below Cuzco, 3240 m: SMF 81794; Fort Sacsahuamau, 3600 m, FMNH 34096-100; Calca, Hacienda Urco, FMNH 34101 (1-22), 34119-22, 34137 (1-19), 34333-35; Cuzco, FMNH 40427 (1-59), 40428, ZFMK 36306-07, ZSM 174/1938; Puno: Limbani, FMNH 39360 (1-7), 40426; Marcapata, FMNH 83171-74; Junín: Quebrada Tranca, near Palca (near Tarma), 3000 m: SMF 81791.
- Proctoporus guentheri*—Bolivia: Cochabamba: Yungas del Palmar, ZSM 43/1950/1-2; between Pajacti and Palmar, ZFMK 66692; Cochabamba, ZSM 165/1954/1-2; Santa Cruz: Samaipata, SMF 81842, ZFMK 60174-75; Peru: Junín: Chanchamayo, 1200 m, FMNH 40616, 45475; La Merced, ZSM 290/1929; Cuzco: Cuzco, ZSM 173/1938.
- Proctoporus luctuosus*—"Venezuela": ZMB 1162, 58910.
- Proctoporus pachyurus*—Peru: Junín: near Palca, 2700 m, MHNSM 20555-58; SMF 80603-05, 80607-08, ZFMK 76999; Tarma, 3000 m, FMNH 134384-90; Huanuquillo (near Tarma), 3300-3800 m, FMNH 134391; between Acobamba and Palcamayo, below Tarma, 2900 m, SMF 65284-88.
- Proctoporus striatus*—Colombia: Cundinamarca: Arrayán, E of Monserrate, 3100 m, SMF 79955-58; Santa Fe de Bogotá: ZMB 5142.
- Proctoporus ventrimaculatus*—Peru: Cajamarca: Cajamarca, 2700 m, BMNH 1946.8.2.34; no specific locality, SMF 79951-52.

Manuscript received: 27. September 2002

Author: GUNTHER KÖHLER, Forschungsinstitut und Naturmuseum Senckenberg, Senckenberganlage 25, D-60325 Frankfurt a.M., Germany.