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## A New Species of *Abronia* (Lacertilia: Anguidae) from Oaxaca, Mexico

DAVID A. GOOD AND KURT SCHWENK

*Abronia kalaina*, a member of the *A. deppii* species group, is described from the Sierra Juarez of Oaxaca, Mexico, where it occurs in cloud forests on Cerro Pelón with *A. mitchelli*. Despite this geographic proximity, ample morphological differences exist to distinguish the two species. Among other species of *Abronia*, *A. kalaina* most closely resembles *A. fuscolabialis*.

THE anguid lizard genus *Abronia* inhabits pine-oak and cloud forests in the highlands of central and southern Mexico and northern Central America. A major center of diversity is in the Sierra Madre del Sur of Guerrero and Oaxaca, Mexico, where *A. deppii*, *A. oaxacae*, *A. fuscolabialis* and *A. mixteca* occur (Bogert and Porter, 1967). Campbell (1982) recently described a fifth species, *A. mitchelli*, from Cerro Pelón in the Sierra Juárez of northern Oaxaca. We describe here another species from Cerro Pelón.

A remarkable feature of the distribution of the species of *Abronia* is their extreme allopatry. Smith and Alvarez del Toro (1963) suggested that Tihen (1954) included specimens of both *A. ochoterenai* and *A. lythrochila* in his diagnosis of the former species and they used this as evidence for the possible co-occurrence of these two species in the vicinity of Santa Rosa, Comitán, Chiapas. Aside from this questionable record, no example of sympatry in the genus has been reported.

In March 1980, the junior author collected a specimen of *Abronia* from the cloud forest on the north slope of Cerro Pelón, Oaxaca. Campbell (1982) described *A. mitchelli* from the same area. While we cannot unequivocally document sympatry because of the difference in elevation of the type localities, the two species occupy similar habitat on Cerro Pelón. We here describe the new species as:

*Abronia kalaina* sp. nov.  
(Figs. 1-2)

*Holotype*.—MVZ 177806, an adult male collected on 30 March 1980 by Kurt Schwenk and Gerhard Roth approximately 5 m above the ground in a tree near a bus stop shed 16.6 km (by road) north of the summit on Hwy. 175, Cerro Pelón, Sierra Juárez, Oaxaca, Mexico, ca 2,300 m elevation (Fig. 3).

*Etymology*.—The specific epithet is from the Greek "kalainos" meaning "shifting between blue and green," from the root "kalais" meaning "turquoise," in the reference to the color in life of the holotype.

*Diagnosis*.—*Abronia kalaina* has paired postmentals and lacks protuberant supraauricular scales; it is therefore a member of the *A. deppii* rather than the *A. aurita* species group. The latter consists of *A. aurita*, *A. lythrochila*, *A. matudai*, *A. montecristoi*, *A. ochoterenai*, *A. salvadorensis* and *A. vasconcelosii* (Tihen, 1954; Hidalgo, 1983). Within the *A. deppii* group (species listed in Table 1), *A. kalaina* is distinguished from all other species by the contact of the frontoparietals along the midline of the head, excluding contact of the frontal and the interparietal, the midline contact of the second pair of large chin shields, and the virtual fusion of the frontoparietals with the frontal. Although some head scale patterns vary intraspecifically in *Abronia*, none of these characters was observed in any other specimen examined.

*Description of holotype*.—The holotype is an 86 mm (snout-vent) adult male. The tail length, though missing the tip, is 105 mm. This is a small, slender, graceful-looking lizard without the greatly expanded occipital region seen in the males of several species of *Abronia*. The head is 19 mm from the tip of the rostral to the anterior margin of the auricular opening and 15 mm wide at its broadest point.

Single pairs of anterior and posterior internasals, the former separating nasals from rostral. Supranasals unexpanded. Frontonasal in contact with posterior internasals, canthals, and prefrontals, but isolated from frontal by contact of prefrontals along midline of snout. Cantholoreale series consisting of single large posterior cantholoreale, anterior canthal, and anterior loreal. Two small postnasals. Five medial and three

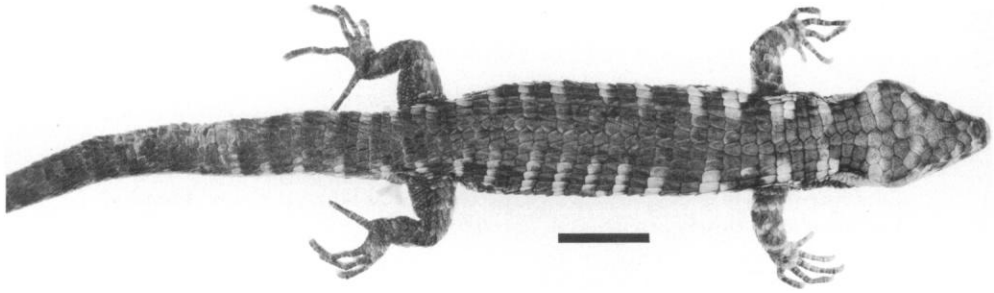


Fig. 1. *Abronia kalaina*, sp. nov. Photograph of the holotype, dorsal view. Bar = 1 cm.

lateral supraoculars, one preocular, two suboculars, and three postoculars. Superciliary series consisting of five scales on left and seven on right, anteriormost contacting cantholoreal but not prefrontal. Four anterior temporals, the lower two contacting postoculars. Subocular fails to contact temporals on right but contacts narrowly on left. Three secondary temporals. Frontoparietals contact on midline, separating frontal from interparietal. Frontoparietals virtually fused with frontal. Parietals isolated from medial supraoculars by uppermost anterior temporals which also contact frontoparietals. Single interoccipital, flanked by unreduced postparietals. Two rows of scales between occipital and first row of nuchals. Eleven supralabials on right, 12 on left; penultimate in contact with orbit. Infralabials ten and nine and sublabials four and five on left and right, respectively. Three pairs of large and one pair of smaller chinshields; both first and second large pairs in contact on midline. Postmentals paired.

Thirty-two transverse (from first nuchal to posterior margin of thighs) and 14 longitudinal (at midbody) rows of dorsals. Scales in medial seven longitudinal rows weakly keeled. Scales on side of trunk not rounded posteromedially and do not give oblique appearance to longitudinal scale rows. No granular scales between transverse rows. Lateral fold containing at most one or two rows of granular scales. Transition from neck granulars to ventrals gradual. Minimum number of transverse nuchals six.

Fifty-nine transverse ventral scale rows between postmentals and vent and 14 longitudinal ventral scale rows at midbody. Eight longitudinal rows of dorsal scales between hind limbs.

In life the holotype was brilliant turquoise, with 11–12 darker turquoise cross bands on a

background of lighter blue-green. These cross bands, distinct laterally, merged down the center of the back. The tail was similarly banded. The head and limbs were mottled with dark and light areas. The ventral surface had reduced dark pigmentation, present only on the posterior  $\frac{2}{3}$  of the trunk and to some extent on the tail. In alcohol, this pattern is retained but the bright turquoise color has dulled to a blue-gray.

*Comparisons.*—Characters frequently used to distinguish members of the *A. deppii* group are listed in Table 1. Only single specimens of *A. kalaina*, *A. bogerti*, *A. chiszari* and *A. mitchelli* are known, so some of these differences may be due to individual variation. Nonetheless, sufficient differentiation exists to warrant recognition of all described species including *A. graminea* and *A. taeniata* which are usually considered subspecies of *A. taeniata*. A possible exception is *A. chiszari* which is similar to *A. bogerti* (Smith and Smith, 1981).

Unexpanded supranasals, as found in *A. kalaina*, occur in all other species of the *A. deppii* group except *A. reidi*, in which they are expanded to the midline, and *A. mitchelli*, in which they are only slightly expanded. The supranasal on one side of the holotype of *A. chiszari* is also slightly expanded, but Smith and Smith (1981) considered this to be due to individual variation.

A reduction in dorsal osteoderm development is putatively characteristic of all *A. deppii* group species except *A. fuscolabialis* and *A. graminea* (Tihen, 1954; Werler and Shannon, 1961; Bogert and Porter, 1967; Smith and Smith, 1981; Campbell, 1982). However, X-ray photographs show that osteoderms are also found over the entire dorsum of *A. taeniata* and are present, though much reduced, in *A. kalaina*,

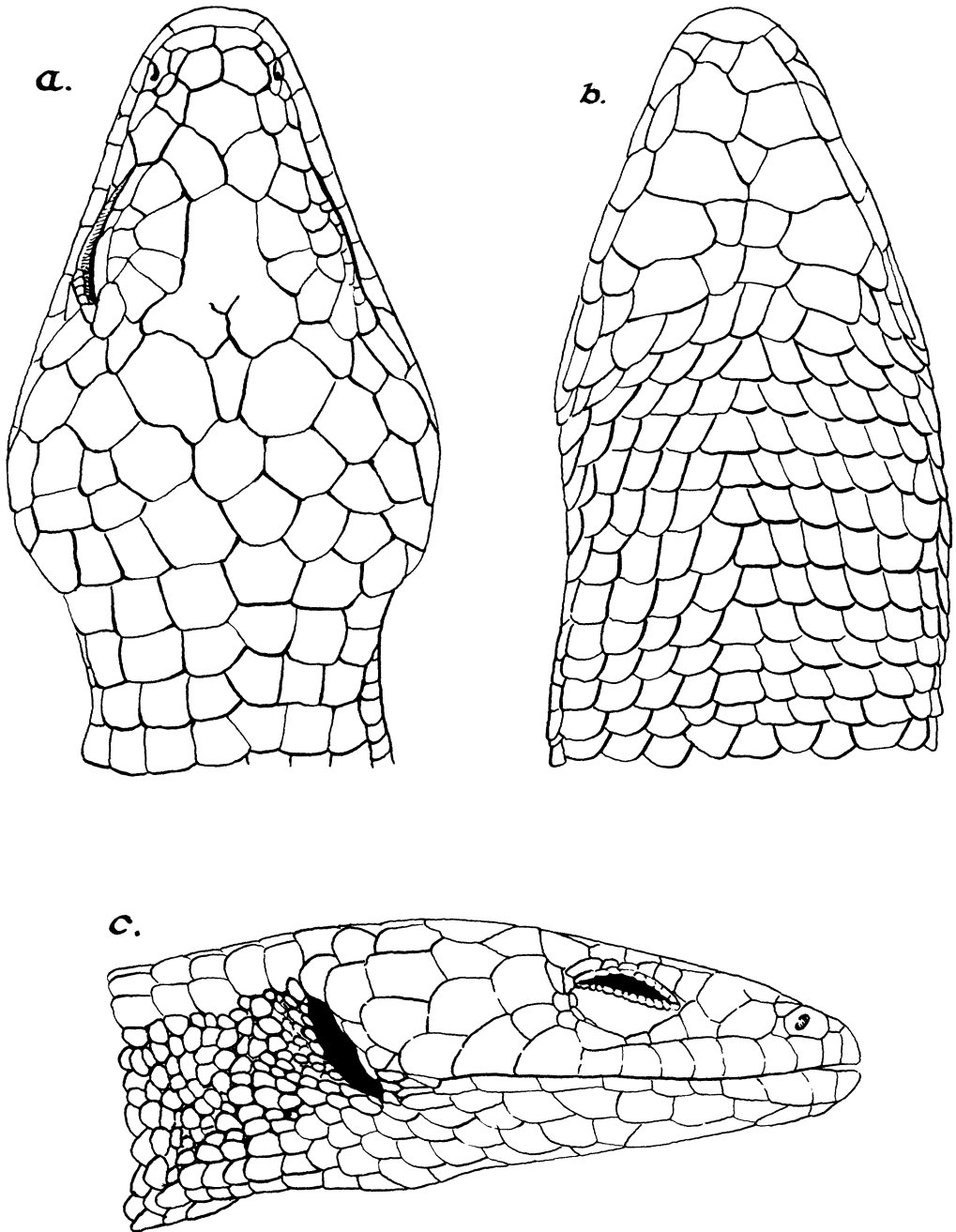


Fig. 2. *Abronia kalaina*, sp. nov., head scalation. Drawn from the holotype. See text for discussion. a) Dorsal view. b) ventral view. c) Lateral view.

*A. mitchelli* and *A. oaxacae*. We have not examined *A. bogerti*. Although *A. bogerti* and *A. chiszari* have been listed as species lacking dorsal osteoderms (Tihen, 1954; Smith and Smith, 1981),

both are known only from young animals in which osteoderm development might be expected to be slight. The only specimen of *A. reidi* available for X-ray examination was the

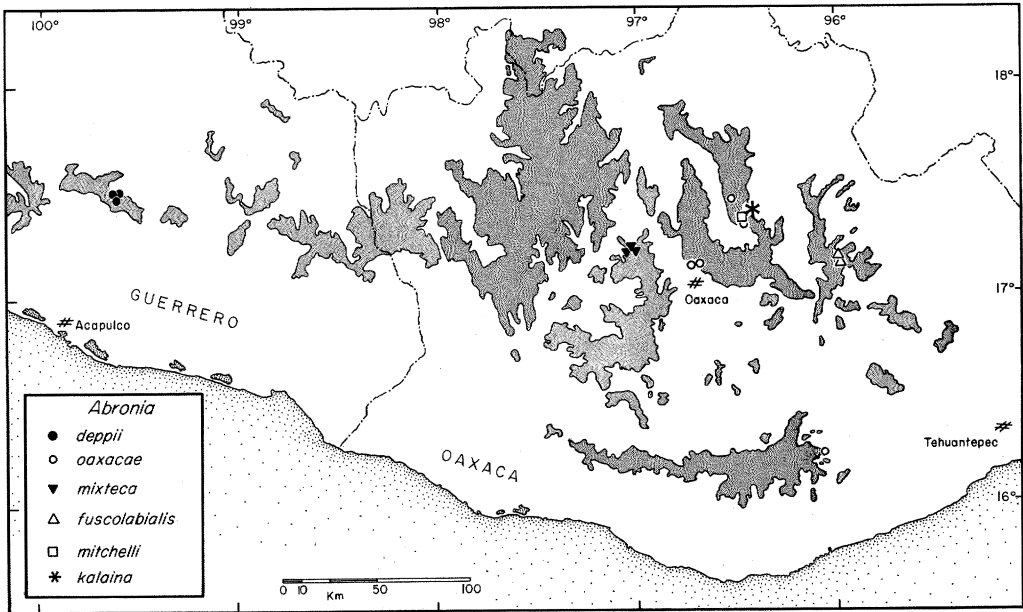


Fig. 3. Distribution of the species of *Abronia* in the Sierra Madre del Sur of southern Mexico. See text for discussion. Stippled areas = mountainous regions over 2,000 m.

paratype, also a juvenile, which lacked osteoderms. Werler and Shannon (1961) stated that adult *A. reidi* also lack osteoderms although an external examination of the holotype suggests that reduced osteoderms may be present (D. B. Wake, pers. comm.).

Although *A. bogerti*, *A. chiszari*, *A. deppii*, *A. kalaina* and, to some extent *A. fuscolabialis*, share the contact of the penultimate supralabial with the orbit, this character is not homologous in all of these species. In *A. bogerti*, *A. chiszari* and *A. deppii* the loss of the lowermost primary temporal causes this contact while in *A. oaxacae*, it results from a general reduction in the posterior temporal area which includes the loss of the last supralabial. In *A. kalaina* and *A. fuscolabialis*, neither of these situations occurs but the posterior supralabials have expanded sufficiently for there to be only two scales between the orbit and the posterior margin of the mouth. The condition in *A. fuscolabialis* is somewhat intermediate.

The minimum number of transverse nuchals is usually described as four for *A. graminea*. A greater number of specimens examined in this analysis possessed six. Smith and Smith (1981) described *A. chiszari* as having seven such scales. This is the result of partial fusion of the medial

two scales. The probable number in this species is eight, as in *A. bogerti*.

In *A. deppii*, *A. mixteca* and *A. oaxacae*, the longitudinal dorsal rows on the flanks lie at an oblique angle to the lateral fold rather than parallel to it. Campbell (1982) stated that *A. mitchelli* shares this character but this is largely an illusion stemming from the position in which the specimen was preserved. If *A. mitchelli* possesses oblique side scales, they are not nearly as oblique as those in the three species above.

#### DISCUSSION

Since *A. kalaina* and *A. mitchelli* both occur on Cerro Pelón and since such close proximity has not been reported within the genus, their status as distinct species might be questioned. This is especially true since each is known only from the type: a male *A. kalaina* and a female *A. mitchelli*. However, *A. kalaina* has neither of the major characters defining *A. mitchelli* (paired interoccipitals and the presence of only a single row of scales between the occipitals and the nuchals) and *A. mitchelli* has none of the major characters defining *A. kalaina* (contact of the frontoparietals and the second pair of chin shields and fusion of the frontoparietals with

TABLE 1. DIAGNOSTIC SCALE CHARACTERS OF SPECIES IN THE *A. deppii* SPECIES GROUP.

Character	<i>A. bogerti</i>	<i>A. chisari</i>	<i>A. deppii</i>	<i>A. fuscoblabialis</i>	<i>A. graminea</i>	<i>A. kalama</i>	<i>A. mitchelli</i>	<i>A. mixteca</i>	<i>A. oaxaca</i>	<i>A. reidi</i>	<i>A. taeniata</i>
Supranasals expanded	-	-	-	-	-	-	+	-	-	+	-
Canthals present	+	+	-	+	-	+	+	-	-	-	+/-
Frontonasal-frontal contact	-	-	+/-	-	-	-	-	-	-	+/-	+/-
Parietal-supraocular contact	+	+	-	-	-	-	-	-	-	+	-
Anterior temporals	2	3	3-4	4	4	4	4	3-4	3	3	4
Anterior temporals contacting postoculars	1	1	1	2	2	2	2	2	2	3	2
Temporal-subocular contact	-	-	-	-	+/-	+/-	+	-	-	+	+/-
Secondary temporals	3	3	3	3	3	3	4	3-4	2-3	4	3
Superciliary-prefrontal contact	-	+/-	-	-	-	-	-	-	-	+	-
Superciliary-cantholoreal contact	?	+	+/-	+	+	+	+	+	-	+	+
Penultimate supralabial contacting orbit	+	+	+	+/-	-	+	-	-	+	-	-
Interoccipitals	1	1	1	1	1	1	2	3	3	1	1
Post-parietals reduced	-	-	-	-	-	-	+	-	-	-	-
Head scale rows behind occipital	2	2	3	2	2	2	1	3	2	2	2
Transverse dorsal scale rows	39	39	24-28	28-29	25-29	32	34	28-31	27-28	34-36	28-34
Longitudinal dorsal scale rows	14	16	10-11	14	14	14	16	12-13	12-13	14	14
Minimum number of nuchal rows	8	8	6	6	4-6	6	6	6	4	6	6
Enlarged lateral neck scales	-?	-	+	-	-	-	-	+	+	-	-
Weak lateral fold	-?	-	+	-	-	-	-	+	+	-	-
Oblique lateral dorsal scale rows	-	-	+	-	-	-	-	+	+	-	-
Posteromedially rounded flank scales	-	-	+	-	-	-	-	+	+	-	-
Longitudinal ventral scale rows	12	12	14	14	12-14	14	12	14	14	12	12
Dorsal rows between hind limbs	8	8	6	8	8	8	10	6	6	8	8
Osteoderm condition in the adult	?	?	absent	present	present	reduced	reduced	absent	reduced	?	present
Dorsal cross bands fewer than 8	-	-	+	-	+	-	?	+	+	-	+

the frontal). In addition, *A. kalaina* and *A. mitchelli* differ in the following characters: degree of supranasal expansion, number of secondary temporals, supralabial contacting the orbit, degree of reduction of the post-parietals, number of longitudinal dorsal scale rows, number of longitudinal ventral scale rows, number of ventral scales between the hind limbs, and several aspects of the color pattern. None of these characters show any sexual differentiation in other species of *Abronia*.

Of the characters that have been used to distinguish species of *Abronia*, virtually all of those shared by *A. kalaina* and *A. mitchelli* (canthal presence, lack of frontonasal-frontal contact, lack of parietal-supraocular contact, four anterior temporals, two of which contact the orbit, lack of superciliary-prefrontal contact, superciliary-cantholorear contact, six nuchal scales, subgranular lateral neck scales, a relatively strong lateral fold, and flank scales that are not posteromedially rounded and do not occur in oblique rows) are primitive for *Abronia* (using *Barisia*, *Gerrhonotus* and *Elgaria* as outgroups). The only derived characters shared by *A. kalaina* and *A. mitchelli* are the reduction of dorsal osteoderms and a reduced number of transverse dorsal scale rows. Both of these characters are shared with several other species.

Campbell (1982) hypothesized that *A. mitchelli* is allied with *A. bogerti*, *A. chiszari* and *A. reidi* because of the presence in these four species of a canthal scale and a high number of transverse dorsal scale rows and the presence in *A. mitchelli* and *A. chiszari* of 16 rather than 14 longitudinal dorsal scale rows. However, all of these characters are primitive within *Abronia* and therefore give no evidence either for or against relationship. The expansion of the supranasals in *A. mitchelli* and *A. reidi* is derived and suggests relationship. The presence of a suite of otherwise primitive characters in these two species suggests that they are basal to the rest of the *A. deppii* group.

*A. kalaina* shares several derived features with a number of members of the *A. deppii* group but seems to be most closely allied with *A. fuscolabialis* with which it shares such features as a gradual transition of neck granulars to ventral scales and dark cross-bands on the venter. Neither of these characters are found in any other species of *Abronia*. An electrophoretic analysis now in progress suggests that these two species are more similar to each other than to any other species included in the survey. However, since

*A. bogerti*, *A. chiszari*, *A. reidi* and *A. mitchelli* were not included, this can not be considered evidence that *A. kalaina* and *A. fuscolabialis* are monophyletic. They differ in the two head scale characters defining *A. kalaina*, in color (*A. fuscolabialis* is bright green), and in the degree of dorsal osteoderm development.

Although *A. kalaina* and *A. mitchelli* are geographically close, they are neither conspecific nor even close relatives. *A. kalaina* is more closely allied with the other species of *Abronia* occurring in the Sierra Madre del Sur (particularly *A. fuscolabialis*) (Fig. 3) while *A. mitchelli* represents a more primitive stock within the genus, which is also represented by *A. reidi* from the Sierra de los Tuxtlas of coastal Veracruz.

#### COMPARATIVE MATERIAL EXAMINED

*A. chiszari*. Mexico: Veracruz: 4.2 km E Cuetzalapán (UTA R-3195, holotype).

*A. deppii*. Mexico: Guerrero: Chilpancingo, 2,135 m (MCZ 33750); Omilteme (MCZ 42716-17, 85248; USNM 113172); 1.8 km E Omilteme, 2,367 m (USNM 148889); 8 km E Omilteme, 2,225 m (USNM 148890-91).

*A. fuscolabialis*. Mexico: Oaxaca: 5.8 km W Totontepec, 2,103 m (LACM 15132, UTA R-9899).

*A. graminea*. Mexico: Puebla: 2.5 km S Paso del Aire or Cumbres (pass just SW Acultzingo on rd to Tehuacan), 2,409 m (CNHM 71002). Veracruz: La Puerta, 50 km SW Orizaba, 2,135 m (MVZ 57465-66); E edge La Joya (MVZ 106322-25); Puerto del Aire (MVZ 106763-64); 1 km W La Joya, off Hwy. 140 NW of Jalapa (MVZ 111213); Cumbre W Acultzingo (just S Puerto del Aire), 2,440 m (MVZ 130000); 0.8 km S Mex. 150 at Puerto del Aire, 2,325 m (MVZ 137081); 9.0 km W (by Mex. Hwy. 150) Acultzingo, then 1.0 km E (by dirt rd) (MVZ 146942-44); La Joya, 2,125 m (4 uncatalogued MVZ specimens).

*A. mitchelli*. Mexico: Oaxaca: Cerro Pelón, N slope Sierra Juárez, 2,800 m (UTA R-10000, holotype).

*A. mixteca*. Mexico: Oaxaca: Tejocotes 2,346-2,592 m (AMNH 102640-43, 102647).

*A. oaxacae*. Mexico: Oaxaca: Cerro San Felipe, 20 km NNE Oaxaca (by Mex. 175) to La Cumbre, then 4 km NW (by dirt rd), 2,897 m (MVZ 144197); Ixtlán de Juárez (MVZ 164364).

*A. reidi*. Mexico: Veracruz: Volcán San Martín, 1,638 m (UIMNH 73732, paratype).

*A. taeniata*. Mexico: Hidalgo: El Chico Parque

Nacional, 2,600–2,700 m (MVZ 109492–93, 128981); 4.3 km E jct. Mex. Hwy. 105 and old Hwy. to Tianguistengo, 1,950 m (3 uncatalogued MVZ specimens); 3.2 km by rd NW Agua Blanca, 2,150 m (2 uncatalogued MVZ specimens).

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## A New Species of *Nansenia* (*N. problematica*) (Salmoniformes: Bathylagidae) from the Southeast Atlantic

DOMINGO LLORIS AND JAUME A. RUCABADO

**A new species, *Nansenia problematica*, is described from five specimens taken on the continental slope off the coast of Namibia (Southwest Africa). To date, only *N. ardesiaca* (off the Cape of Good Hope) and *Nansenia* sp. (just a single specimen off Lüderitz) have been reported from the Southeast Atlantic.**

THE Benguela IV scientific cruise took place in April–May 1981. The ship involved was a fishing-factory vessel specially outfitted for exploratory fishing, and the study was made over a little-known part of the Namibian shelf and

slope (Southwest Africa) at depths ranging between 400 and 650 m, with some isolated trawls down to 800 m. More information on the cruise may be obtained from the authors or E. Macpherson.