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The systematics of the pseudoscorpion family Ideoroncidae (Pseudoscorpiones: Neobisioidea) in the New World

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Abstract. A review of the pseudoscorpion family Ideoroncidae in North and South America has revealed seven genera and 43 species. The genus *Albiorix* occurs in xeric environments in western USA and in Mexico, with two outlying species in Chile and Argentina. It includes 18 species, including five new species from Mexico (*A. meraculus*, *A. minor*, *A. oaxaca*, *A. puebla* and *A. rosario*), and three from USA (*A. gertschi*, *A. sarahae* and *A. vigintus*). *Albiorix bolivari* is treated as a junior synonym of *A. retrodentatus*. The genus *Ideoroncus* has nine species and is endemic to southern Brazil and Paraguay. *Pseudalbiorix* has four species and occurs in Central America and western Cuba. *Typhloroncus* has six species from Mexico and U.S. Virgin Islands, including the new species *T. planodentatus* from Mexico. *Xorilbia* has three species and occurs in the Amazonian rainforest ecosystems of northern Brazil and southern Venezuela. Two new genera are described: *Mahnertius* Harvey & Muchmore for the new species *M. stipodentatus* (type species) and *M. hadrodentatus*, both from Colombia; and *Muchmoreus* Harvey for the new species *M. ignotus* (type species) from Mexico. Several keys are provided, including one to separate the New World genera, and others to distinguish the species of each genus (apart from the monotypic *Muchmoreus*). The post-embryonic development of New World ideoroncids is reviewed, particularly the trichobothrial patterns of nymphs and adults.

Keywords: Pseudoscorpions, taxonomy, morphology, new species, new genera, post-embryonic development

The pseudoscorpion family Ideoroncidae was first recognized and named by Chamberlin (1930), who included two subfamilies and four genera: the subfamily Ideoroncinae for the genera *Ideoroncus* Balzan 1887 from South America, *Albiorix* Chamberlin 1930 from North America, and *Dhanus* Chamberlin 1930 and *Shravana* Chamberlin 1930 from southeast Asia, and the subfamily Bochicinae for the monotypic *Bochica* Chamberlin 1930 from the West Indies. Beier (1931) added the genera *Negroroncus* Beier 1931 from east Africa and *Dinoroncus* Beier 1931 from Chile, each represented by single species. Beier (1932b) recognized both subfamilies but also added the subfamily Hyinae, which Chamberlin (1930) had previously proposed as a distinct family. Beier (1931, 1932b) added the Bolivian genus *Mirobisium* Beier 1931 to Bochicinae, but this genus was later recognized as a close relative of *Gymnobisium* Beier 1931, and both genera, along with *Vachonobisium* Vitali-di Castri 1963, were treated as members of the family Vachoniidae by Vitali-di Castri (1963) and of the Gymnobisiidae by Beier (1964) and Muchmore (1972). Further genera of Ideoroncinae were added from various tropical regions of the world. Redikorzev (1938) described *Nhatrangia* Redikorzev 1938 from southeast Asia. Beier (1955) and Mahnert (1981a) recognized new African genera, *Nannoroncus* Beier 1955 and *Afroroncus* Mahnert 1981, respectively, whilst Muchmore (1979, 1982b, 1986) described various species of *Typhloroncus* Muchmore 1979 from the Caribbean region. Most recently, Harvey et al. (2007) recognized *Pseudalbiorix* Harvey, Barba, Muchmore and Peréz, 2007 from Central America.

In the meantime, the Hyinae was reinstated as a distinct family by Chamberlin (1946) and *Bochica* was placed in its own family, Bochicidae, by Muchmore (1982a). Bochicidae was later expanded with the inclusion of the previously separate family Vachoniidae by 1992) and 1998). The removal of these various genera from the Ideoroncidae to other families has left a tightly-knit group of genera within Ideoroncidae characterized by the presence of supernumerary trichobothria on the fixed and movable fingers of the pedipalpal chelae, and the median maxillary lyrifissure being located sub-basally on the pedipalpal coxa (1992). The family currently contains 59 species in 10 genera (Harvey 2013) and occurs throughout most tropical and sub-tropical regions of the world with the exception of Australia and West Africa (Harvey 2013).

Of the five named New World genera of the Ideoroncidae, *Ideoroncus* is restricted to Brazil and Paraguay, *Albiorix* is found in Mexico and southwestern U.S.A., as well as Argentina and Chile, *Pseudalbiorix* is found in Cuba, southern Mexico, Belize and Guatemala, *Typhloroncus* occurs in the Virgin Islands and Mexico, and *Xorilbia* is restricted to the Amazonian region (Harvey 2013). Although many New World species have been well described and illustrated, some of the older species are poorly known. In particular the identity of some members of the genus *Albiorix* is difficult to verify based upon the original descriptions. Our attempts to consistently identify new specimens of *Albiorix* from the USA and Mexico based upon the keys presented by Chamberlin (1930) and Hoff (1945) proved ineffective, mainly due to the poor understanding of intraspecific variation within the genus. We have examined numerous specimens as part of a review of the group and here present the results of that study. We present illustrated redescriptions of most of the older species of *Albiorix*, and describe several new

species of *Albiorix* as well as the first species of *Typhloroncus* with eyes. We have also found three new species from Mexico and Colombia that could not be placed in any existing genus, for which we erect two new genera.

METHODS

The specimens examined during this study are deposited in the American Museum of Natural History, New York, New York, USA (AMNH); California Academy of Sciences, San Francisco, California, USA (CAS); Colección Nacional de Arácnidos, Instituto de Biología, Universidad Nacional Autónoma de México, Cuidad de México, Distrito Federal, México (CNAN); Florida State Collection of Arthropods, Gainesville, Florida, USA (FSCA); Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA (MCZ); Museo Zoologio di Università degli Studi di Napoli, Portici, Italy (MZUN); Peabody Museum of Natural History, Yale University, New Haven, Connecticut, USA (PMNH); Bohart Museum of Entomology, University of California, Davis, California, USA (UCDC); University of California, Riverside, California, USA (UCRC) and the Western Australian Museum, Perth, Australia (WAM).

Most specimens newly examined for this study were slide-mounted by the second author (W.B. Muchmore) in Canada balsam, generally using the methods described by Hoff (1949). Other specimens were examined by the senior author (M.S. Harvey) by preparing temporary slide mounts by immersing the specimen in 75% lactic acid at room temperature for one to several days, and mounting them on microscope slides with 10 or 12 mm coverslips supported by small sections of 0.25 mm or 0.50 mm diameter nylon fishing line. Specimens were examined with a Leica MZ16 dissecting microscope, Leica DM2500 or Olympus BH–2 compound microscopes, and illustrated with the aid of a drawing tube. Measurements were taken at the highest possible magnification using an ocular graticule. After study the specimens were returned to 75% ethanol with the dissected portions and placed in 12 × 3 mm glass genitalia microvials (BioQuip Products, Inc.).

The setae of the carapace are shown as a solid line if present, but depicted with a dashed line if the seta was missing from the specimen. Other small dots depicted in the illustrations are small pores, and not setal areolae.

The genera and species treated in this monograph are arranged alphabetically. Terminology and mensuration largely follow Chamberlin (1931), with the exception of the nomenclature of the pedipalps, legs and with some minor modifications to the terminology of the trichobothria (Harvey 1992), chelicera (Harvey & Edward 2007; Judson 2007) and faces of the appendages (Harvey et al. 2012). The notation of the supernumerary trichobothria follows Mahnert (1984a).

Coordinates for the collection localities were calculated using Google Earth or obtained from various other on-line resources. The spellings of the Mexican place names generally follow Reddell (1981).

SYSTEMATICS

Family Ideoroncidae Chamberlin 1930

Ideoroncidae Chamberlin 1930:42; Chamberlin 1931:220; Beier 1932a:166; Beier 1932b:183; Roewer 1937:254; Hoff 1956:25; Murthy and Ananthakrishnan 1977:25–26; Muchmore 1982a: 97–98; Harvey 1991:315; Harvey 1992:1408; Harvey 2013:unpaginated.

Ideoroncinae Chamberlin 1930:44; Chamberlin 1931:220; Beier 1932a:170; Roewer 1937:256; Hoff 1956:25.

Diagnosis.—Species of Ideoroncidae can be readily distinguished from all other pseudoscorpions by the presence of multiple trichobothria on the chelae, with 19 or more on the chelal hand and fixed finger and 10 or more on the movable chelal finger (e.g., Figs. 4, 27B, 31C). Adults of most other pseudoscorpion families have a maximum of 8 trichobothria on the fixed finger and chelal hand, and 4 trichobothria on the movable chelal finger. The only exception is within the family Menthidae, whose members have a pattern of 11 + 4. Ideoroncids can also be easily recognized by the position of the median maxillary lyrifissure, which is situated sub-basally on the pedipalpal maxilla (Fig. 7A) (it is sub-medial or sub-distal in other families) and the deeply divided median genital sac in males (Fig. 6B) (it is usually entire in the majority of families).

Description.—*Adults:* setae: long, straight and acicular.

Chelicera (Figs. 7A, 7B, 28B, 29C): hand with 6–9 setae; movable finger with 1 long seta; rallum of 4 thickened blades; galea simple, long and slender.

Pedipalp: fixed chelal finger and hand with 19–31 trichobothria, movable chelal finger with 10–14 trichobothria (e.g., Figs. 5, 28C, 31C). Venom apparatus present in both chelal fingers, venom ducts long (e.g., Figs. 8C, 24B, 29D, 31E).

Carapace: with 2 bulging eyes (e.g., Figs. 17A, 21A, 27A, 29A), or in some species absent (Fig. 8A).

Coxal region (Fig. 6A): manducatory process with 2 long distal setae; median maxillary lyrifissure present and sub-basally situated.

Legs (Figs. 7F, 7G): femur I and II without basal swelling; femora I and II with primary slit sensillum directed transversely; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; without sub-ungual spine; claws slender and simple.

Abdomen: pleural membrane longitudinally striate (Fig. 6F); spiracles simple, with spiracular helix (Fig. 6E); setae of anterior genital operculum (sternite II) of female very small (Fig. 6D).

Genitalia: male median genital sac bipartite (Fig. 6B); female with large gonosac covered with scattered pores (Fig. 6C).

Post-embryonic development.—Mahnert (1979, 1981a, 1981b, 1984a), Harvey (1992) and Harvey et al. (2007) presented data on the trichobothrial patterns occurring in the nymphs of various species of Ideoroncidae. Mahnert (1979, 1984a) provided complete post-embryonic sequences (i.e., protonymph, deutonymph, tritonymph and adult) for a single New World species (*Ideoroncus setosus*) and partial data on one or two nymphal stages in addition to the adult (*I. divisus*, *I. lenkoi*, *I. paranensis* and *Albiorix arboricola*). Harvey et al. (2007) provided data for *Pseudalbiorix reddelli* and partial data for *P. armasi* (tritonymph) and *P. veracruzensis* (tritonymph). We now add complete data for *A. chilensis* (Fig. 4), and partial data for *A. anophthalmus* (deutonymph), *A. conodentatus* (tritonymph and deutonymph), *A. meraculus* (tritonymph), *A. mexicanus* (tritonymph), *A. parvidentatus* (tritonymph), *A. retrodentatus* (tritonymph) and *Muchmoreus ignotus* (tritonymph) (Table 1). As in all pseudoscorpions

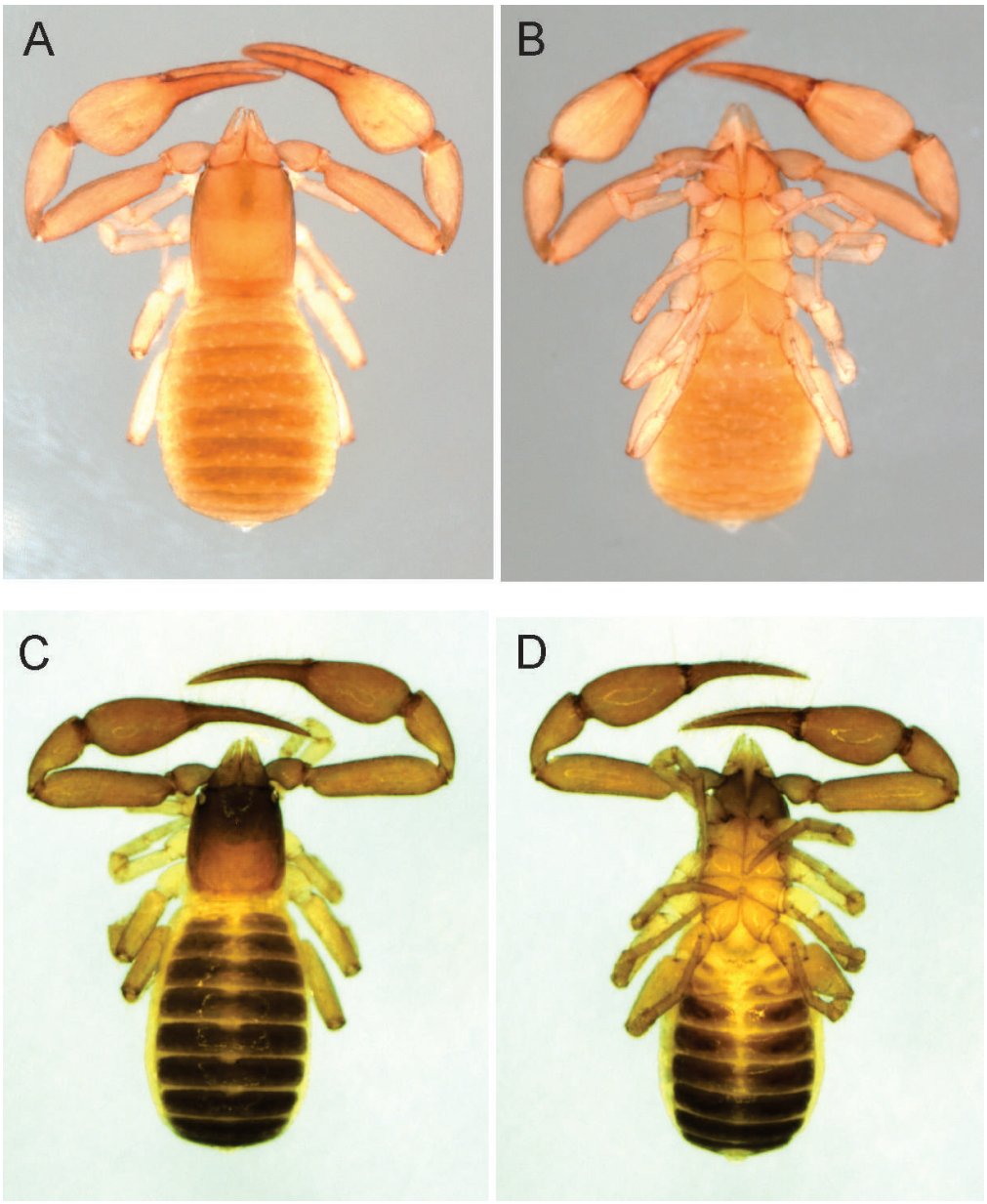

Figure 1.—A, B. *Albiorix parvidentatus* Chamberlin, female from Tucson, Arizona, USA. (WAM T129656); C, D. *Pseudalbiorix veracruzensis* (Hoff), male from Acatlán, Oaxaca, Mexico (WAM T65487): A, C, dorsal; B, D, ventral.

(e.g., Vachon 1964), there is a progressive addition of trichobothria at each post-embryonic stage. The general pattern of trichobothrial development in New World ideoroncids is similar between species, with a pattern of 3/1 in protonymphs, 9/6 in deutonymphs, 14–15/8 in tritonymphs and 20–22/10 in adults (Table 1). These figures exclude the occasional variation in total trichobothrial numbers when individual trichobothria are occasionally added or are lost (e.g., Mahnert 1984a; Table 1).

Ideoroncid protonymphs have three trichobothria on the fixed finger (*eb*, *et* and *ist*) and one on the movable finger (*t*), forming a pattern of 3/1, which is standard for all pseudoscorpions. The deutonymphal stage of Iocheirata is usually characterized by a 6/2 pattern, although reductions to slightly lower numbers occur in species with reduced adult trichobothria (Harvey 1987, 2011; Mahnert 1984b; Vitali-di Castri 1965). The New World ideoroncid deutonymphs have extra trichobothria in the *ist* (for a total of 2) and *t* (4) regions, and the de novo addition of trichobothria in the *est* (2), *ib* (2), *it* (1) and *b* (2) regions. Tritonymphs have extra trichobothria in the *est* (4–5), *ib* (3–4), *ist* (3) and *t* (5) regions, and the *de novo* addition of trichobothria in the *esb* (1) and *st* (1) regions. The adults have additional trichobothria in the *est* (6), *ib* (4–6), *ist* (4–6) and *t* (6) regions, and the *de novo* addition of trichobothria in the *isb* (1) and *sb* (1) regions.

The slight differences observed in the tritonymphs of different species are not always reflected in the corresponding adults; i.e., those tritonymphs with a pattern of 14/8 have adults with a

Table 1.—The number of trichobothria occurring on New World species of Ideoroncidae, including known nymphal stages. Variant numbers are shown in parentheses.

		eb	*esb*	*est*	*et*	*ib*	*isb*	*ist*	*it*	*b*	*sb*	*st*	*t*	Fixed finger, total	Movable finger, total	Reference
Albiorix anophthalmus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
	Deutonymph	1	-	2	1	2	-	2	1	2	-	-	4	9	6	This study
Albiorix argentiniensis	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Mahnert (1984a)
Albiorix chilensis	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	This study
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	This study
	Deutonymph	1	-	2	1	2	-	2	1	2	-	-	4	9	6	This study
	Protonymph	1	-	-	1	-	-	1	-	-	-	-	1	3	1	This study
Albiorix conodentatus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
	Tritonymph	1	1	5	1	3	-	3	1	2	-	1	5	15	8	This study
	Deutonymph	1	-	2	1	2	-	2	1	2	-	-	4	9	6	This study
Albiorix edentatus	Adult	1	1	6	1	4	1	6	1	2	1	1	6	21	10	This study
	Tritonymph	1	1	5	1	3	-	3	1	2	-	1	5	15	8	This study
Albiorix gertschi	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Albiorix magnus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Albiorix meraculus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	This study
Albiorix mexicanus	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Mahnert (1984a); this study
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	This study
Albiorix minor	Adult	1	1	6	1	5	1	6 (4, 5)	1	2	1	1	6	22 (20, 21)	10	This study
Albiorix mirabilis	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Albiorix oaxaca	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Albiorix parvidentatus	Adult	1	1	6	1	5 (4)	1	6 (4, 5)	1	2	1	1	6	22 (20, 21)	10	This study
	Tritonymph	1	1	5	1	3	-	3	1	2	-	1	5	15	8	This study
Albiorix puebla	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Albiorix retrodentatus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
	Tritonymph	1	1	5	1	3	-	3	1	2	-	1	5	15	8	This study
Albiorix rosario	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Albiorix sarahae	Adult	1	1	6	1	4	1	6	1	2	1	1	6	21	10	This study
Albiorix vigintus	Adult	1	1	6	1	5	1	4	1	2	1	1	6	20	10	This study
Ideoroncus anophthalmus	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Mahnert (1984a)
Ideoroncus beieri	Adult	1	1	6	1	4	1	6 (5)	1	2	1	1	6	21 (20)	10	Mahnert (1984a)
Ideoroncus cavicola	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	(Mahnert 2001)
Ideoroncus divisus	Adult	1	1	6	1	4	1	4	1	2	1	1	6	21	10	Mahnert (1984a)
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	Mahnert (1984a)
Ideoroncus lenkoi	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Mahnert (1984a)
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	Mahnert (1984a)
Ideoroncus pallidus	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Mahnert (1984a)
Ideoroncus paranensis	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Mahnert (1984a)
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	Mahnert (1984a)
Ideoroncus procerus	Adult	1	1	6	1	4 (5)	1	6	1	2	1	1	6	21 (22)	10	Mahnert (1984a)
Ideoroncus setosus	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Mahnert (1984a)
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	Mahnert (1984a)
	Deutonymph	1	-	2	1	2	-	2	1	2	-	-	4	9	6	Mahnert (1984a)
	Protonymph	1	-	-	1	-	-	1	-	-	-	-	1	3	1	Mahnert (1984a)
Mahnertius hadrodentatus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Mahnertius stipodentatus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Muchmoreus ignotus	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	This study
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	This study
Pseudalbiorix armasi	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Harvey et al. (2007)
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	Harvey et al. (2007)
Pseudalbiorix muchmorei	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Harvey et al. (2007)
Pseudalbiorix reddelli	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Harvey et al. (2007)
	Tritonymph	1	1	4	1	3	-	3	1	2	-	1	5	14	8	Harvey et al. (2007)
	Deutonymph	1	-	2	1	2	-	2	1	2	-	-	4	9	6	Harvey et al. (2007)
	Protonymph	1	-	-	1	-	-	1	-	-	-	-	1	3	1	Harvey et al. (2007)
Pseudalbiorix veracruzensis	Adult	1	1	6	1	4	1	5	1	2	1	1	6	20	10	Harvey et al. (2007)
	Tritonymph	1	1	4	1	3	-	4	1	2	-	1	5	15	8	Harvey et al. (2007)
Typhloroncus attenuatus	Adult	1	1	6	1	4	1	7	1	2	1	1	6	22	10	This study

Table 1.—Continued.

		eb	*esb*	*est*	*et*	*ib*	*isb*	*ist*	*it*	*b*	*sb*	*st*	*t*	Fixed finger, total	Movable finger, total	Reference
Typhloroncus coralensis	Adult	1	1	6	1	4	1	7	1	2	1	1	6	22	10	This study
Typhloroncus diabolus	Adult	1	1	6	1	4	1	7	1	2	1	1	6	22	10 (11)	This study
Typhloroncus planodentatus	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	This study
Typhloroncus troglobius	Adult	1	1	6	1	4	1	7	1	2	1	1	6	22	10	This study
Typhloroncus xilitlensis	Adult	1	1	6	1	4	1	7	1	2	1	1	6	22	10	Muchmore (1986)
Xorilbia arboricola	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	Mahnert (1984a)
	Tritonymph	1	1	4	1	4	-	3	1	2	-	1	5	15	8	Mahnert (1984a)
	Protonymph	1	-	-	1	-	-	1	-	-	-	-	1	3	1	Mahnert (1979)
Xorilbia gracilis	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	Mahnert (1985b)
	Tritonymph	1	1	4	1	4	-	3	1	2	-	1	5	15	8	Mahnert (1985b)
	Protonymph	1	-	-	1	-	-	1	-	-	-	-	1	3	1	Mahnert (1985b)
Xorilbia lamellifer	Adult	1	1	6	1	5	1	6	1	2	1	1	6	22	10	Mahnert (1985b)

pattern of 20/10 (*A. chilensis*, *A. mexicanus*, *Ideoroncus lenkoi*, *I. paranensis*, *I. setosus, M. ignotus*, *P. armasi*, *P. reddelli*), 21/10 (*I. divisus*) or 22/10 (*A. meraculus*), and those tritonymphs with a pattern of 15/8 have adults with 20/10 (*P. veracruzensis*), 21/10 (*A. edentatus*) or 22/10 (*A. conodentatus*, *A. parvidentatus*, *A. retrodentatus*, *Xorilbia arboricola* and *X. gracilis*).

Other significant differences between the various life stages include the lack of a cheliceral galeal seta and the absence of a posterior maxillary lyrifissure in all protonymphs.

Subterminal tarsal seta.—The paired subterminal tarsal setae achieve several different morphologies in the Ideoroncidae. They are bifurcate or trifurcate in most species, but are completely acuminate in *Typhloroncus planodentatus*, *T. xilitlensis* and species of *Xorilbia*. The greatest intra-generic variation was found in *Albiorix*, where it ranged from trifurcate with all tines short and sub-equal in length (e.g., Figs. 10G, 15D), to trifurcate with long tines (Fig. 13E), to trifurcate with one tine much longer than the others (Fig. 18E) to bifurcate with long tines (Figs. 14F, 22E). The morphology was found to be consistent on all legs of an individual, and was constant between species and each post-embryonic stage.

Distribution.—The family Ideoroncidae occurs in east Africa, Asia, and the Americas. Although mostly confined to tropical biotypes, they also inhabit temperate habitats in North and South America (Fig. 2). They have been mostly found in leaf litter or on the underside of rocks, but some species live within caves where they have developed into highly modified troglobites with long appendages and no eyes (Muchmore 1982b; Muchmore & Pape 1999).

The New World fauna is patchily distributed and most genera are allopatric, with the only zone of overlap being southern Mexico where species of *Albiorix* coincide with species of *Typhloroncus* and *Pseudalbiorix* (Fig. 2). *Albiorix* occurs in southwestern USA and Mexico, as well as two outlying species in Chile and Argentina (Fig. 2A). The remaining South American fauna consists of *Xorilbia* in the Amazon region, *Mahnertius* in Colombia, and *Ideoroncus* in southern Brazil and neighboring Paraguay (Fig. 2). The remaining American ideoroncid genera are *Muchmoreus*, which is restricted to the Yucatan Peninsula, *Pseudalbiorix* in southern Mexico and adjacent countries, and *Typhloroncus* with species from Mexico and the US Virgin Islands (Fig. 2).

Remarks.—Ideoroncidae is an easily recognized family, which was suggested to be the sister-group to the family Bochicidae by Harvey (1992). This result was not confirmed by Harvey & Volschenk (2007) in an analysis of several exemplar species of the seven families of Neobisioidea. Instead, they found that Ideoroncidae was sister to all other Neobisioidea, with the exception of the Bochicinae. Both results suggest that the Ideoroncidae are a relatively basal clade of Neobisioidea.

KEY TO NEW WORLD GENERA OF IDEORONCIDAE

1. Arolium much longer than claws and without ventral hooked process (e.g., Figs. 8A, 29I) 2
   Arolium shorter than claws or same length as claws and with ventral hooked process (e.g., Figs. 27F, 31D) 5
2. Arolium deeply divided (e.g., Figs. 9D, 21G) . . . . . *Albiorix*
   Arolium not divided (Fig. 29I) 3
3. Condyle on external margin of chelal hand large and bifurcate . . . . . *Pseudalbiorix*
   Chelal hand with retrolateral condyle small and rounded 4
4. Sternites with median suture line; each spiracular plate with 1 seta . . . . . *Ideoroncus*
   Sternites without median suture line; each spiracular plate with 2 or 3 setae . . . . . *Muchmoreus*
5. Distal teeth of fixed chelal finger raised into a short ridge (Fig. 28H) . . . . . *Mahnertius*
   Distal teeth of fixed chelal finger not raised into a short ridge (Fig. 31E) 6
6. Arolium divided; anal operculum not abutting sternite X . . . . . *Xorilbia*
   Arolium not divided; anal operculum either closely abutting or adjacent to sternite X (Figs. 30A–C) . . . . . *Typhloroncus*

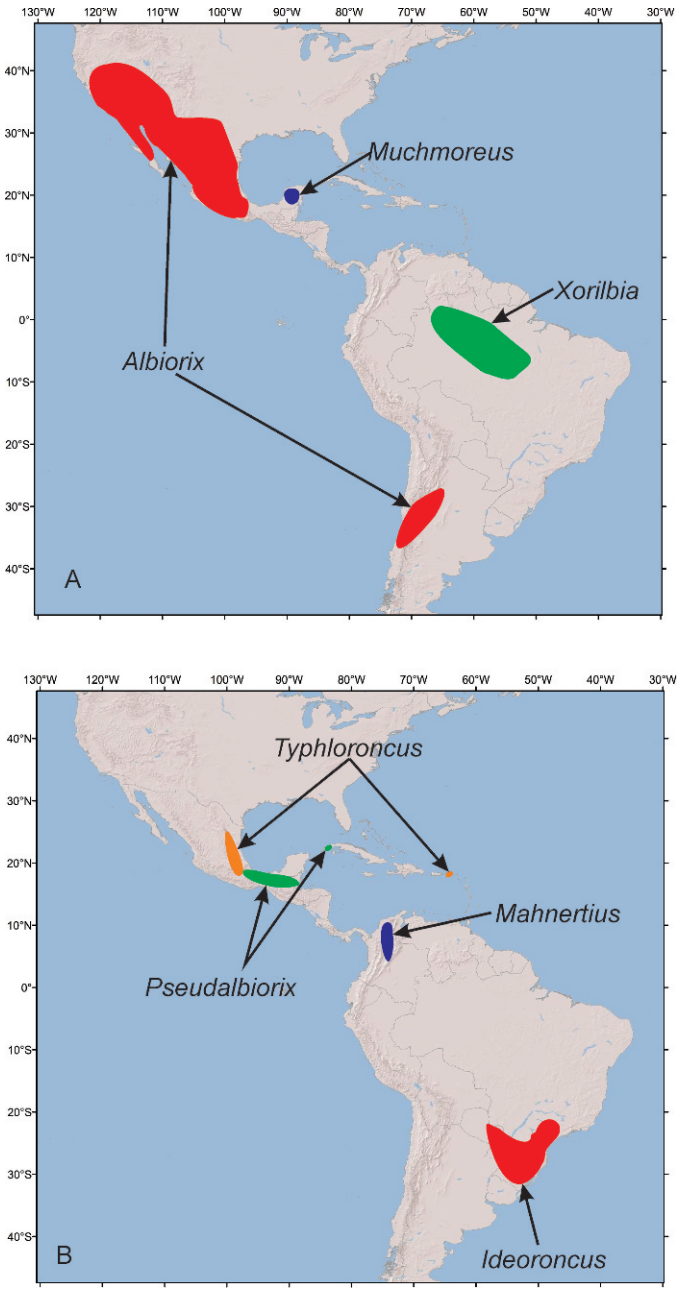

Figure 2.—Distribution of the genera of Ideoroncidae in the New World: A. *Albiorix*, *Muchmoreus* and *Xorilbia*; B. *Ideoroncus*, *Mahnertius*, *Pseudalbiorix* and *Typhloroncus*.

Albiorix Chamberlin 1930

Albiorix Chamberlin 1930:44; Beier 1932a:172; Hoff 1945:1; Hoff 1956:25; Mahnert 1984a:671; Harvey 1991:316; Harvey 2013:unpaginated.

Dinoroncus Beier 1931:305; Beier 1932a:171 (synonymized by Mahnert 1984a:676).

Type species.—*Albiorix: Ideoroncus mexicanus* Banks 1898, by original designation *Dinoroncus*: *Ideobisium (Ideoroncus) chilense* Ellingsen 1905, by original designation.

Diagnosis.—Species of *Albiorix* possess deeply divided arolia (e.g., Figs. 9D, 21G), a feature that is nearly unique within the Ideoroncidae, and that elsewhere amongst pseudoscorpions is restricted to most species of Garypinidae. Species of *Xorilbia* also have divided arolia, but unlike *Albiorix*, the arolia are shorter than the claws and the arolium has a ventral hook.

Description.—*Adult:* setae: long, straight and acicular.

Chelicera (Figs. 7A, 7B): hand usually with 6 setae, occasionally with 5 or very rarely 7 setae; movable finger with 1 long subdistal seta; rallum of 4 thickened blades (Fig. 7C), all blades serrate in some species, only the two distal blades serrate in others; lamina exterior absent; galea long and slender.

Pedipalp: long and slender; patella with disto-prolateral excavation; fixed chelal finger and hand with 20 or 22 trichobothria (very rarely 19 or 21), movable chelal finger with 10 trichobothria (e.g., Fig. 4): *eb* region with 1 trichobothrium; *est* region with 6 (5 in one specimen) trichobothria; *ib* region with 4 or 5 trichobothria; *ist* region with 5 or 6 trichobothria; *b* region with 2 trichobothria; *sb* and *st* regions with 1 trichobothrium; and *t* region with 6 trichobothria; *st* not ventrally displaced. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near *t* region in movable finger; chelal teeth all closely spaced; base of fixed chelal finger with several small denticles (Figs. 7D, 7E); chelal hand with retrolateral condyle small and rounded (Fig. 7E).

Carapace: with 2 small, bulging eyes (e.g., Figs. 10A, 15E), or absent (Fig. 8A); without furrows or with faint posterior furrow near posterior margin; anterior margin with 4 or occasionally 6 setae.

Coxal region (Fig. 6A): manducatory process with 2 long distal setae; median maxillary lyrifissure present and subbasally situated.

Legs (Figs. 7F, 7G): femora I and II without basal swelling; femora I and II with primary slit sensillum directed transversely; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; metatarsal pseudotactile seta sub-proximal; legs with subterminal tarsal setae either bifurcate or trifurcate; arolium longer than claws, deeply divided (e.g., Figs. 9D, 21G), without ventral hooked protuberance; without sub-ungual spine; claws slender and simple.

Abdomen: tergites and sternites undivided. Pleural membrane longitudinally striate (Fig. 6F). Each stigmatic sclerite with 1 seta (Fig. 6E); spiracles simple, with spiracular helix. Anterior margin of anal operculum not abutting posterior margin of sternite X (Fig. 7H).

Genitalia: male median genital sac bipartite (Fig. 6B); female with large gonosac covered with scattered pores (Fig. 6C); setae of anterior genital operculum (sternite II) of female very small (Fig. 6D).

Tritonymph: Pedipalp: fixed finger with 14 or 15 trichobothria, movable finger with 8 trichobothria (e.g., Figs. 4C, 10E, 11E, 14E, 15B, 16E); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria; *isb* and *sb* absent.

Deutonymph: Pedipalp: fixed finger with 9 trichobothria, movable finger with 6 trichobothria (e.g., Figs. 4B, 10H, 11F);

eb, *ist, it* and *et* regions each with 1 trichobothrium; *ib* region with 2 trichobothria; *est* region with 3 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 4 trichobothria; *esb*, *isb, sb* and *st* absent.

Protonymph: Pedipalp: *eb*, *et*, *ist* and *t* regions each with 1 trichobothrium; others absent (Fig. 4A).

Remarks.—The genus *Albiorix* was erected by Chamberlin (1930) for three species of ideoroncid pseudoscorpions from Mexico and southwestern USA each possessing long, divided arolia. The type species, *Ideoroncus mexicanus* Banks, was recorded by Chamberlin (1930) as *A. mexicanus* throughout the western USA and Mexico, whereas *A. parvidentatus* Chamberlin and *A. edentatus* Chamberlin were restricted to California. Several species have been subsequently added to the genus from the New World (Hoff 1945, 1950; Beier 1963; Muchmore 1982b; Muchmore & Pape 1999), but some have since been removed to other genera. *Albiorix reddelli* Muchmore 1982 and *A. veracruzensis* Hoff 1945 were transferred to the new genus *Pseudalbiorix* by Harvey et al. (2007), as they lack the long, divided arolia characteristic of *Albiorix*, and have a bifid retrolateral chelal condyle that is lacking in *Albiorix*. Although *A. arboricola* Mahnert 1979, *A. gracilis* Mahnert 1985 and *A. lamellifer* Mahnert 1985 from Amazonian Brazil have divided arolia (Mahnert 1984a, 1985b), the arolium of these species is distinctly shorter than the claws and possesses a small ventral hook (Harvey & Mahnert 2006, Fig. 1; Mahnert 1984a, Fig. 41). This hook is absent in the remaining species of *Albiorix*, but occurs in other ideoroncids including *Dhanus siamensis* (With 1906) and in species of *Negroroncus* and *Typhloroncus* (Vachon 1958; M.S. Harvey pers. obs.). These differences led Harvey & Mahnert (2006) to transfer the three Brazilian *Albiorix* species to the new genus *Xorilbia*.

The genus *Dinoroncus* was established by Beier (1931) for *Ideobisium (Ideoroncus) chilense* Ellingsen 1905, which was described from a single specimen from Santiago, Chile (Ellingsen 1905). New records of this species were reported by Feio (1945) from La Rioja Province in northwestern Argentina, and Hoff (1950) added a second species to the genus, *D. argentiniensis* Hoff 1950, from La Sébila, also in La Rioja Province, Argentina. Hoff (1950) also suggested that the Argentinian records of *D. chilensis* were most likely misidentified specimens of *D. argentiniensis*. Although Mahnert (1984a) was unable to examine any specimens of *I. chilense*, his study of *D. argentiniensis* led him to believe that the genus *Dinoroncus* should be regarded as a synonym of the genus *Albiorix*, as the latter species possessed the deeply divided arolium characteristic of that genus. Our study of the holotype of *I. chilense* and other specimens attributed to that species has revealed that they indeed have long, divided arolia (Fig. 9D), and the synonymy of *Dinoroncus* with *Albiorix* is confirmed.

Etymology.—Chamberlin (1930) did not provide an etymology for the genus *Albiorix*, but Harvey et al. (2007) assumed it was named for the Celtic god Albiorix. Chamberlin (1930) also did not specifically nominate a gender for *Albiorix*, but the three species originally included were treated as masculine (*A. mexicanus*, *A. edentatus* and *A. parvidentatus*), and subsequent authors have since added obviously masculine names (Hoff 1945; Muchmore & Pape 1999), confirming that the genus name is masculine.

KEY TO SPECIES OF *ALBIORIX*

1. One pair of eyes present (e.g., Figs. 17A, 23A) 2
   Eyes completely absent (Fig. 8A) . . . . . *A. anophthalmus*
2. Chelicera with 5 setae (Fig. 7B); anterior margin of carapace with 6 setae (Fig. 9B); trichobothrium *ib* region of chelal hand with 4 trichobothria (Figs. 5B, 9E); trichobothrium *t* region overlapping with *est* region (Figs. 5B, 9E) . . . . . *A. chilensis*
   Chelicera with 6 setae (Fig. 7A); anterior margin of carapace with 4 setae (Figs. 13A, 18A); trichobothrium *ib* region of chelal hand with 5 trichobothria (Figs. 5F, 5G, 5K); trichobothrium *t* region distal to *est* region (Figs. 5F, 5G, 5K, 13C, 14C, 15C) 3
3. Chelal hand completely smooth (Fig. 17B) . . . . . *A. mirabilis*
   Chelal hand with prolateral and, usually, retrolateral margins granulate, sometimes weakly so (e.g., Figs. 13B, 19B, 23B) . . 4
4. Subterminal tarsal seta bifurcate (Figs. 14F, 22E) 5
   Subterminal tarsal seta trifurcate (e.g., Figs. 13E, 19F, 21G) 6
5. Subterminal tarsal seta with each tine very long (Fig. 14F) . . . . . *A. meraculus*
   Subterminal tarsal setae with each tine short (Fig. 22E) . . . . . *A. rosario*
6. Subterminal tarsal seta with 1 very long distal tine and 2 short basal tines (Fig. 18E) . . . . . *A. oaxaca*
   Subterminal tarsal seta with each tine short and of similar length (e.g., Figs. 13E, 19F, 21G) 7
7. Larger species, e.g., chela (with pedicel) greater than 1.9 mm in length . . . . . *A. magnus*
   Smaller species, e.g., chela (with pedicel) less than 1.9 mm in length 8
8. Chelal teeth of the fixed finger very closely spaced (Figs. 13C, 13D); trichobothrium est_4 situated basally, overlapping with *ist* group (Figs. 5C, 9C) . . . . . *A. conodentatus*
   Chelal teeth of the fixed finger not so closely spaced (e.g., Figs. 11D, 19D, 21D); trichobothrium est_4 situated distally, never overlapping with *ist* group (e.g., Figs. 19C, 21C, 23C) 9
9. Teeth of fixed chelal finger very low, much longer than high (Fig. 11D) . . . . . *A. edentatus*
   Teeth of fixed chelal finger higher than long (e.g., Figs. 15C, 21D) 10
10. Tips of the teeth of the fixed chelal finger sharply pointed (Fig. 15C) . . . . . *A. mexicanus*
    Tips of the teeth of the fixed chelal finger slightly rounded (e.g., Figs. 12D, 21D) 11
11. Median teeth of fixed chelal finger with noticeably sinuate distal face (Figs. 20D, 21D) 12
    Median teeth of fixed chelal finger with straight or slightly sinuate distal face (e.g., Figs. 16D, 19D) 13
12. Larger species, e.g. chela (with pedicel) greater than 1.2 (male) mm in length; trichobothrium ist_1 slightly dorso-distal to ist_3 (Fig. 21C) . . . . . *A. retrodentatus*

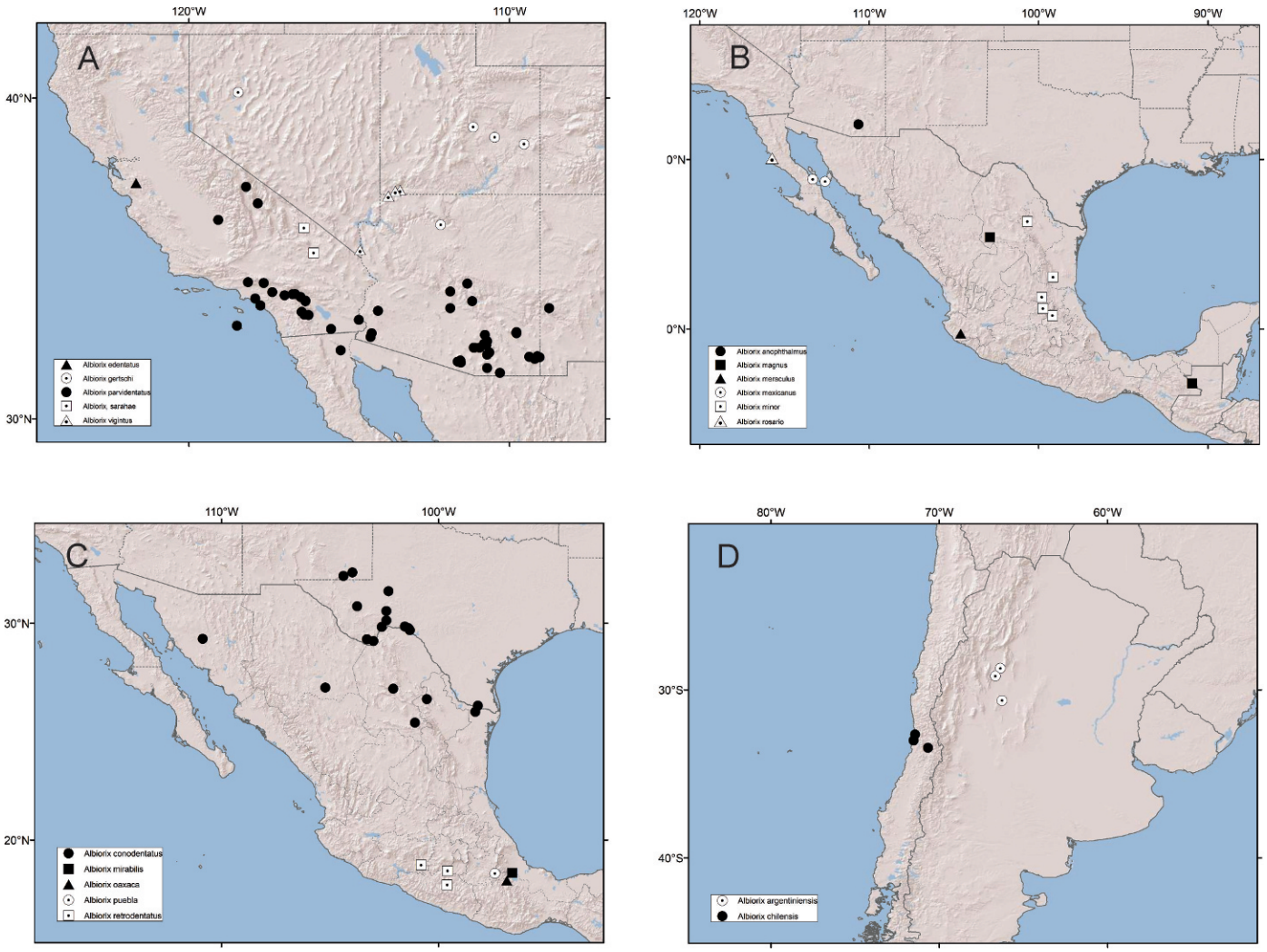

Figure 3.—Distribution of *Albiorix* species.

Smaller species, e.g., chela (with pedicel) less than 1.0 (male) mm in length; trichobothrium ist_1 directly dorsal to ist_3 (Fig. 20C) . . . . . *A. puebla*

13. Trichobothrium ib_5 distally displaced, situated far distal of *eb*, *esb* and *isb* (Figs. 12C, 23C, 24B) 14
    Trichobothrium ib_5 not distally displaced, situated about on same level as *eb*, *esb* and *isb* (Figs. 16C, 19C) 16
14. Fixed chelal finger and hand with 22 trichobothria, with ist_1 present (Figs. 12B, 12C) . . . . . *A. gertschi*
    Fixed chelal finger and hand with 20 or 21 trichobothria, with ist_1 absent (Figs. 23B, 23C, 24A, 24B) 15
15. Fixed chelal finger and hand with 20 trichobothria, *ist* region with 4 trichobothria (Fig. 24B) . . . . . *A. vigintus*
    Fixed chelal finger and hand with 21 trichobothria, *ist* region with 5 trichobothria (Fig. 23C) . . . . . *A. sarahae*
16. Larger species, e.g., chela (without pedicel) 1.67 (female) mm in length . . . . . *.A. argentiniensis*
    Smaller species, e.g. chela (without pedicel) less than 1.5 (female) mm in length 17
17. Teeth of fixed chelal finger only slightly longer than high (Fig. 16D) . . . . . *A. minor*
    Teeth of fixed chelal finger noticeably longer than high (Fig. 19D) . . . . . *A. parvidentatus*

Albiorix anophthalmus Muchmore 1999
Figs. 3B, 5A, 8

Albiorix anophthalmus Muchmore, in Muchmore and Pape 1999:138–141, Figs. 1a–c, 2, 4; Harvey 2013:unpaginated.

Types examined.—USA: *Arizona*: Holotype male, Arkenstone Cave, Colossal Cave Mountain Park, Pima County (32°04′N, 110°38′W), 9 September 1990, R.B. Pape (FSCA, WM7541.01001). Paratypes: USA: *Arizona*: 1 female (allotype), same data as holotype, except 22 March 1992 (FSCA, WM7807.01001); 1 male, same data as holotype, except 11 August 1990 (FSCA, WM7540.01001); 1 deutonymph, same data as holotype, except 9 June 1991 (FSCA, WM7707.01001).

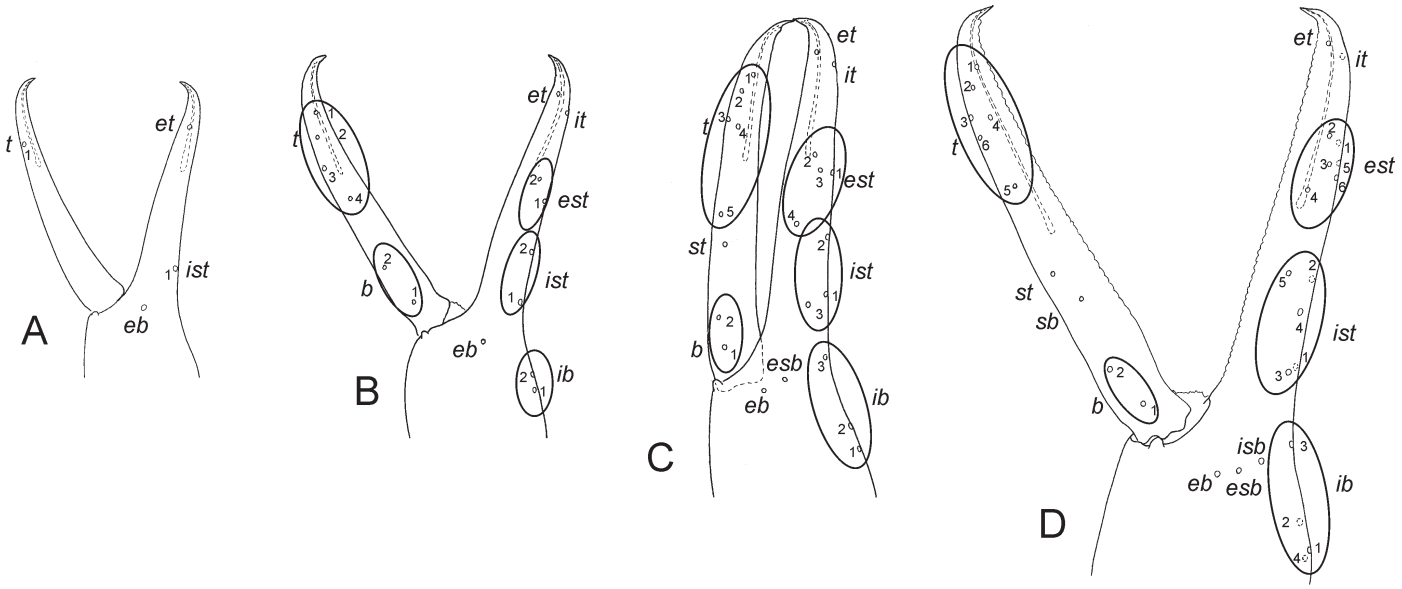

Figure 4.—Left chela (or a mirror image of the right chela), post-embryonic trichobothrial patterns of *Albiorix chilensis* (Ellingsen), specimens from 1 km E. of Maitencillo (UCDC), unless stated otherwise: A. Protonymph; B. Deutonymph; C. Tritonymph (UCDC, Jardin Botanico Nacional); D. Adult male.

Other material examined.—USA: *Arizona*: 1 female, Colossal Cave, Pima County (32°04′N, 110°38′W), no date, J. Cowles (WAM T91621).

Diagnosis.—This highly troglomorphic species is the only known species of *Albiorix* that lacks eyes (Fig. 8A).

Description.—*Adult:* See Muchmore & Pape (1999), except as follows: Pedipalp: fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Figs. 5A, 8C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region; base of fixed chelal finger with several small denticles.

Deutonymph: Chelicera: galea long, slightly curved; hand with 5 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.15, femur 5.29, patella 3.57, chela (with pedicel) 4.97, chela (without pedicel) 4.73 × longer than broad. Fixed finger with 9 trichobothria, movable finger with 6 trichobothria (Fig. 8E); *eb*, *ist, it* and *et* regions each with 1 trichobothrium; *ib* region with 2 trichobothria; *est* region with 3 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 4 trichobothria; *esb*, *isb, sb* and *st* absent. Chelal hand with retrolateral condyle small and rounded.

Carapace: anterior margin medially prominent; eyes absent; with 4 setae on anterior margin and 2 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, subbasal.

Legs: much as in adult.

Dimensions (mm): Body length ca. 1.87. Pedipalp: trochanter 0.237/0.110, femur 0.608/0.115, patella 0.446/0.125, chela (with pedicel) 1.004/0.202, chela (without pedicel) 0.955, hand (without pedicel) length 0.352, movable finger length 0.590. Carapace 0.557/? (distorted).

Remarks.—*Albiorix anophthalmus* is a highly modified blind troglobite known only from caves within the Colossal Cave Mountain Park in southern Arizona (Fig. 3B). Muchmore & Pape (1999) summarized numerous records within Arkenstone Cave where individuals were found on the underside of broken calcite pieces and limestone rocks on the floor of the cave.

We have reexamined the four type specimens collected in Arkenstone Cave used to compile the original description (Muchmore & Pape 1999), as well as an additional female collected in nearby Colossal Cave. Although the original description tentatively identified 20 trichobothria on the fixed chelal finger and hand (Muchmore & Pape 1999), we can now detect 22 trichobothria (Figs. 5A, 8C).

Albiorix argentiniensis (Hoff 1950)
Fig. 3D

Dinoroncus chilensis (Ellingsen): Feio 1945:4 (misidentification).
Dinoroncus argentiniensis Hoff 1950:229–232, Figs. 7–9.
Albiorix argentiniensis (Hoff): Mahnert 1984a:675–676, Fig. 44; Harvey 1991:316; Ceballos & Ferradas 2008:109–110; Mahnert et al. 2011:9–10; Harvey 2013:unpaginated.

Material examined.—None. The holotype was originally lodged in the J.A. Rosas Costas collection, but subsequently destroyed by Rosas Costas himself (Mahnert et al. 2011).

Diagnosis.—*Albiorix argentiniensis* is a moderately large species [e.g. chela (without pedicel 1.67 (female) mm in length]. It differs from *A. chilensis*, the only other South American species of *Albiorix*, by the trichobothrium *t* region not overlapping with the *est* region.

Description.—See Hoff (1950) and Mahnert (1984a).

Remarks.—We have not examined any specimens of this species, which has only been recorded from La Rioja Province in northwestern Argentina, including the type locality La Sébila (Hoff 1950), Bazán (incorrectly spelled 'Balzan' by

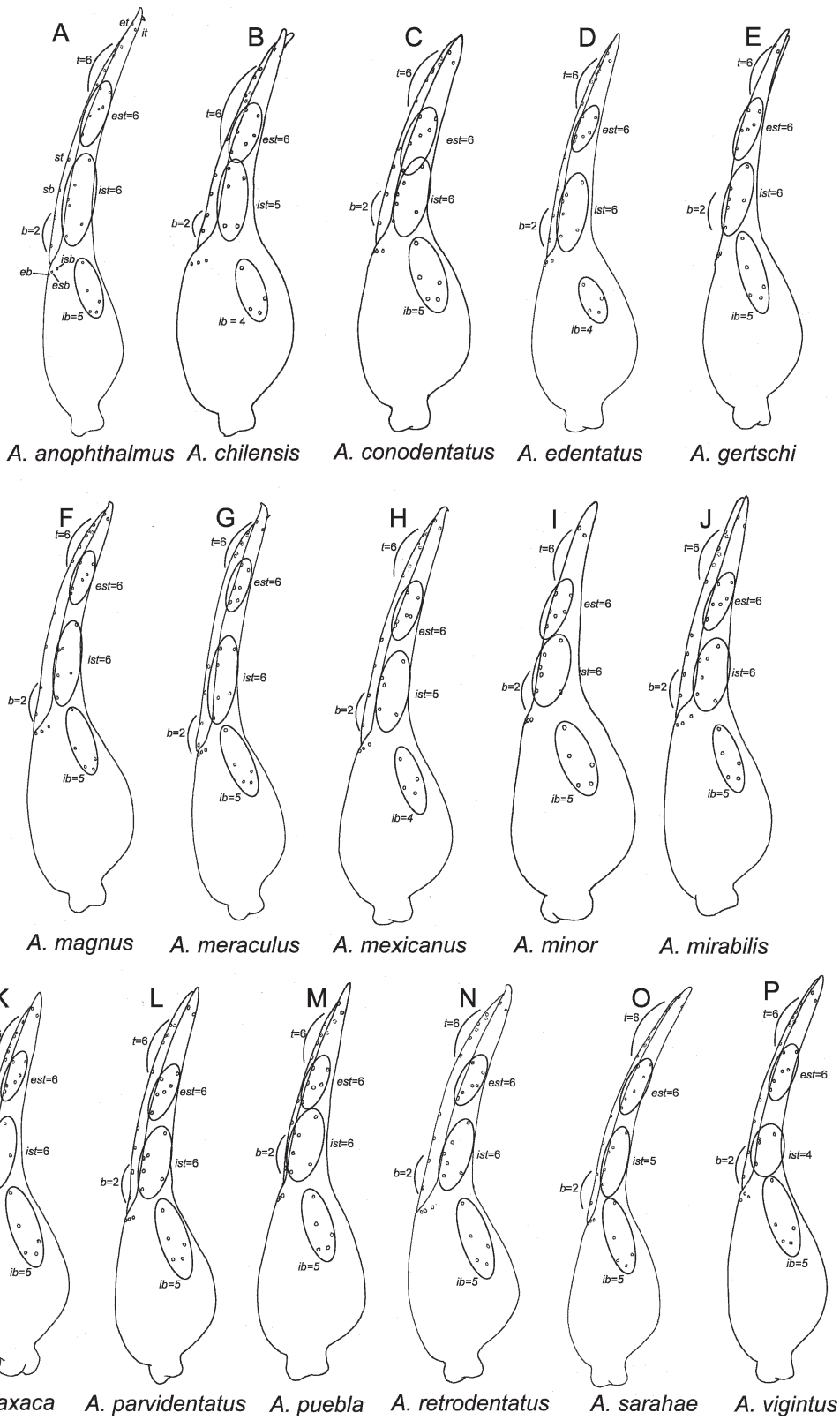

Figure 5.—Trichobothrial patterns of *Albiorix* species, taken from left chela (or a mirror image of the right chela). Not shown are *A. argentiniensis* (Hoff) (not studied) and *A. rosario* Harvey & Muchmore sp. nov. (sole specimen has the chela mounted laterally).

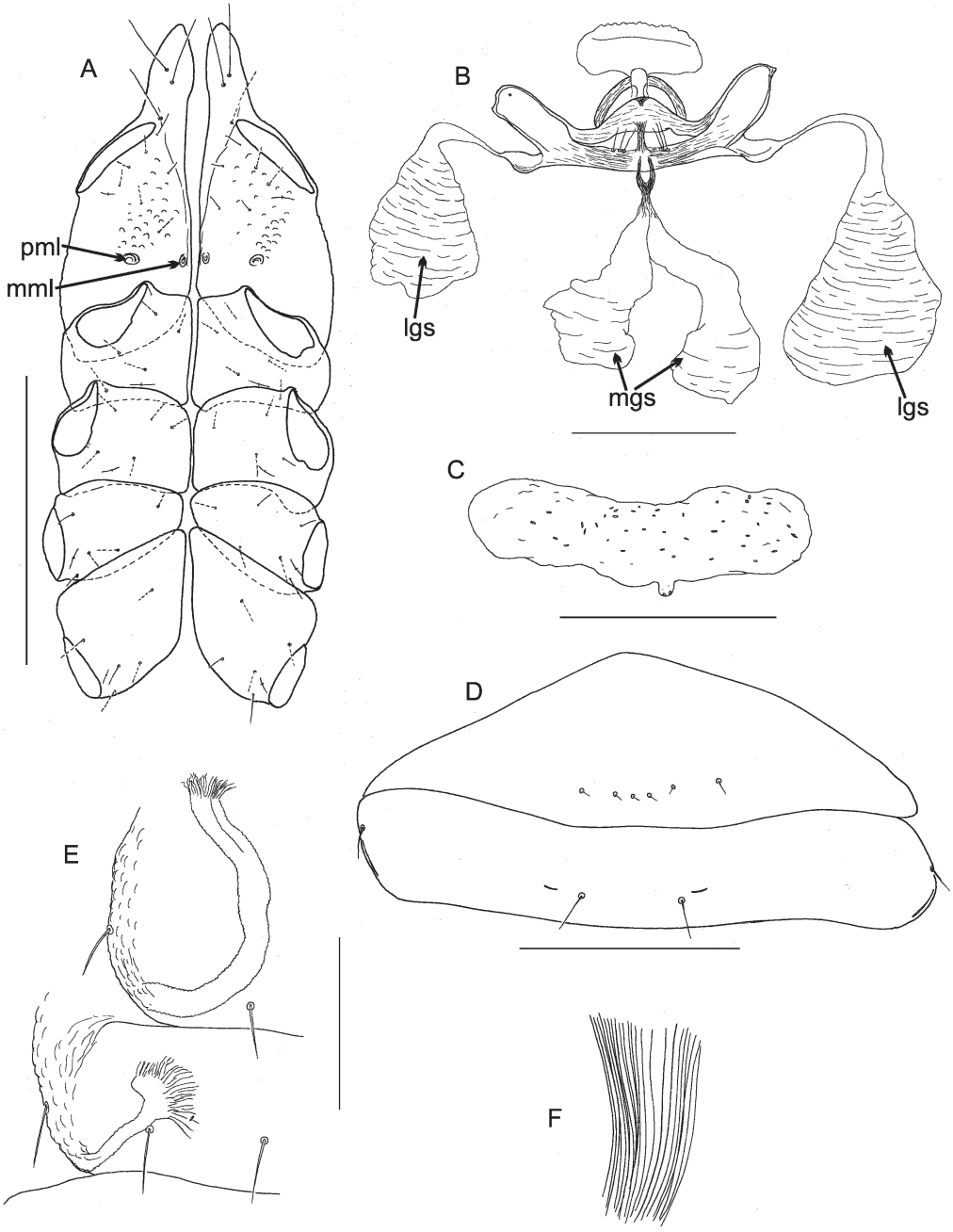

Figure 6.—*Albiorix* spp.: A. Coxal region, ventral [*A. mexicanus* (Banks), female neotype]; B. Male genitalia, ventral (*A. parvidentatus* Chamberlin, CAS, JC–1371.01001, male); C. Gonosac (*A. parvidentatus*, CAS, JC–375.02001, female); D. Sternites II and III (*A. parvidentatus*, CAS, JC–375.02001, female); E. Spiracular region, ventral (*A. parvidentatus*, CAS, JC–1371.01001, male); F. Pleural membrane (*A. parvidentatus*, CAS, JC–1371.01001, male). Abbreviations: lgs, lateral genital sac; mgs, median genital sac; mml, median maxillary lyrifissure; pml, posterior maxillary lyrifissure. Scale lines = 0.5 mm (A); 0.2 mm (C, D); 0.1 mm (B, E, F).

Feio) and Olta (Feio 1945) (Fig. 3D). The long and deeply divided arolium (Mahnert 1984a) confirms that this species is correctly placed in *Albiorix*.

Albiorix chilensis (Ellingsen 1905)
Figs. 3D, 4, 5B, 7B, 9

Ideobisium (Ideoroncus) chilense Ellingsen 1905:326–327.

Dinoroncus chilensis (Ellingsen): Beier 1931:305 [as *Dinoroncus chilense* [sic)]; Beier 1932a:172, Fig. 202; Roewer 1937:257; Beier 1964:324–325; Cekalovic 1984:13.

Albiorix chilensis (Ellingsen): Mahnert 1984a:676; Harvey 1991:316–317; Harvey 2013:unpaginated.

Not *Dinoroncus chilensis* (Ellingsen): Feio 1945:4 (misidentification; see *Albiorix argentiniensis* (Hoff)).

Material examined.—*Holotype*. CHILE: *Región Metropolitana*: female, Santiago (33°27′S, 70°40′W), 10 April 1899, F. Silvestri (MZUN).

Other material. CHILE: *Valparaíso*: 1 male, 1 female, 1 deutonymph, 1 protonymph, 1 km E. of Maitencillo (‘‘Marteneillo’’ on labels) (32°39′S, 71°26′W), 16 March

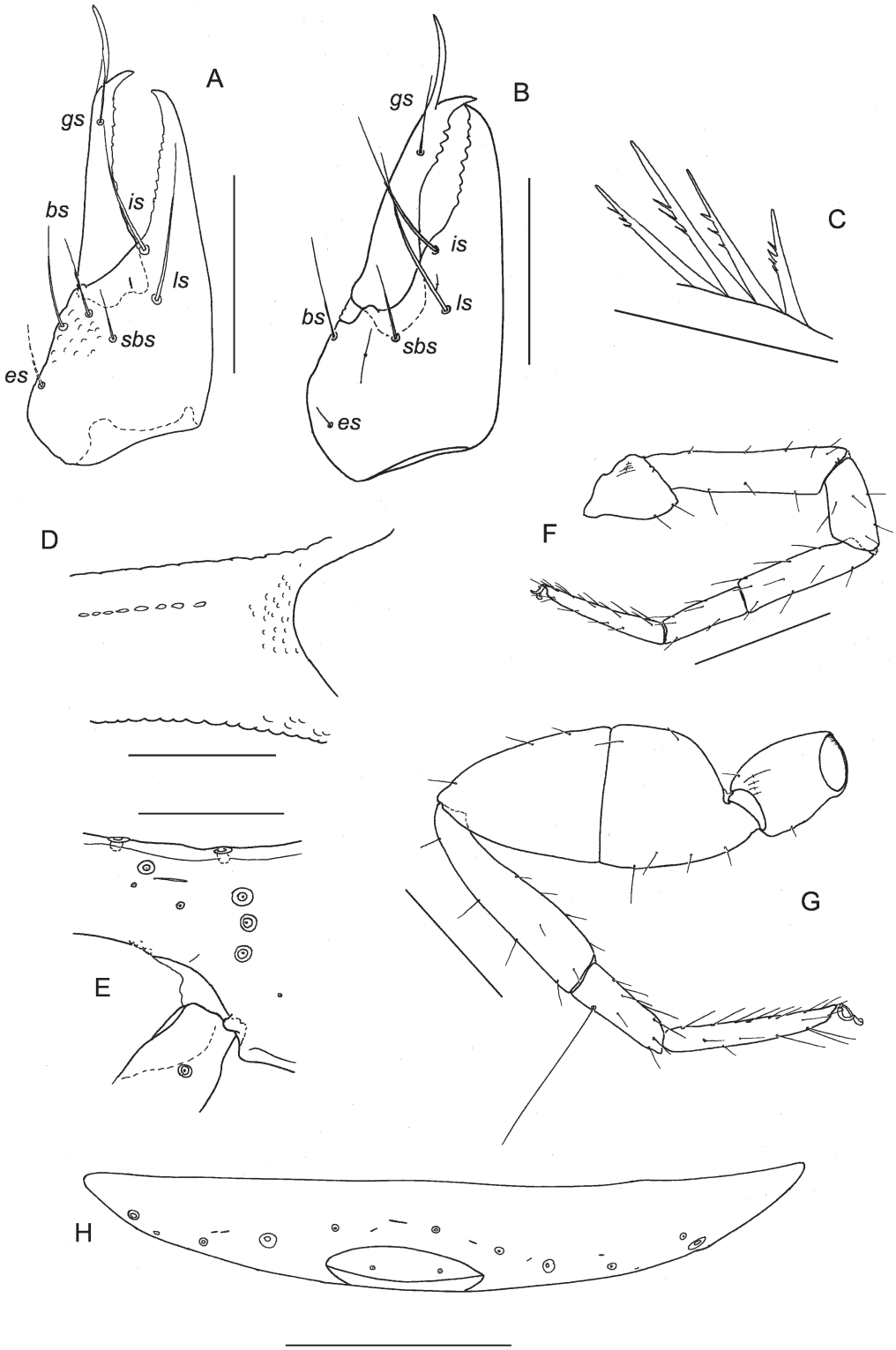

Figure 7.—*Albiorix* spp.: A. Left chelicera, dorsal [*A. mexicanus* (Banks), female neotype]; B. Left chelicera, dorsal [*A. chilensis* (Ellingsen), male]; C. Rallum (*A. mexicanus*, female neotype); D. Fixed chelal finger, showing denticles, ventral (*A. mexicanus*, female neotype); E. Chelal fingers, showing denticles, lateral (*A. parvidentatus*, male holotype); F. Left leg I (*A. parvidentatus*, male holotype); G. Right leg IV (*A. parvidentatus*, male holotype); H. Sternite XI (*A. parvidentatus*, CAS, JC–375.02001, female). Scale lines = 0.25 mm (B); 0.2 mm (A, F, G, H); 0.1 mm (C, D, E).

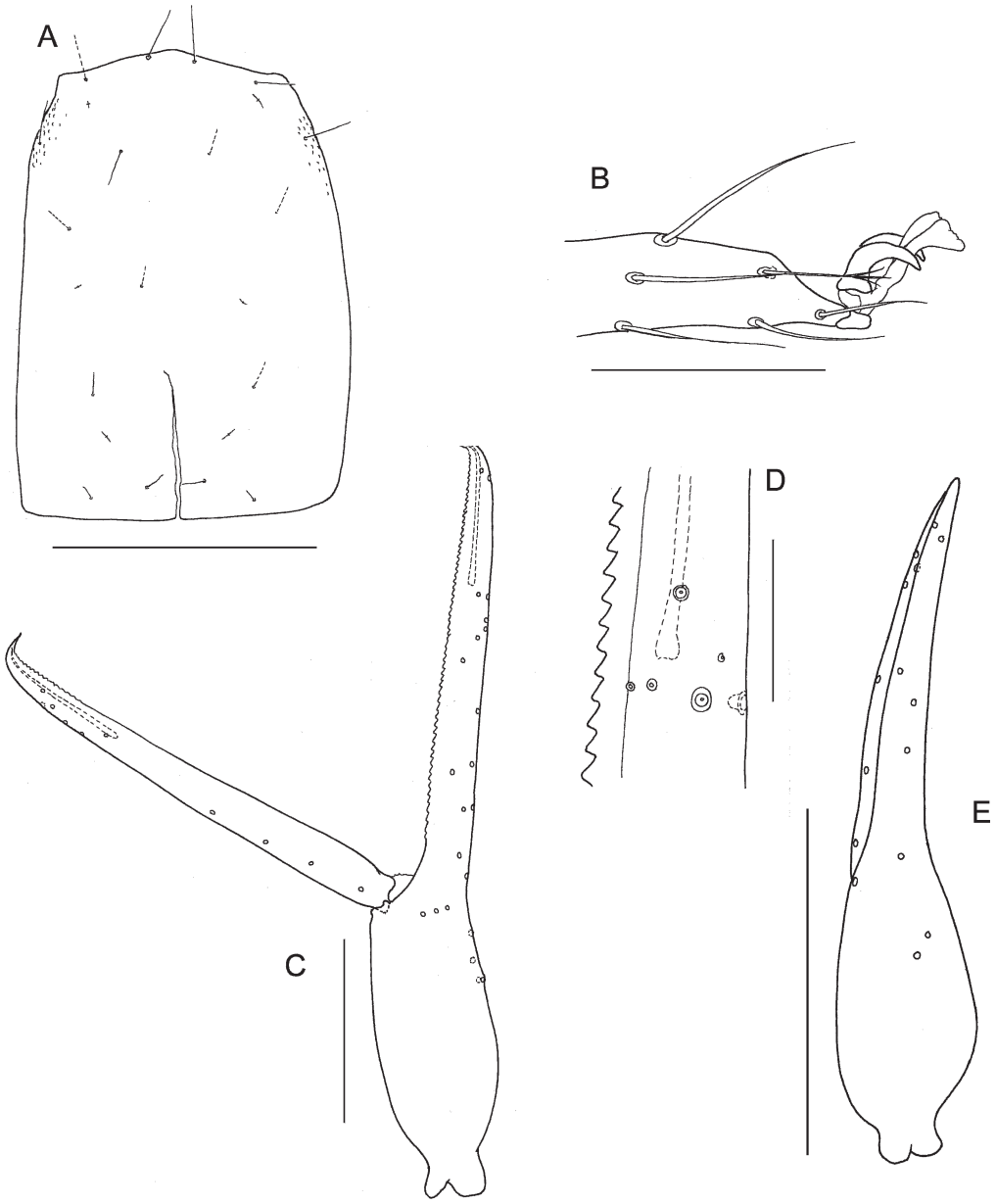

Figure 8.—*Albiorix anophthalmus* Muchmore, male holotype (FSCA, WM7541.01001) unless stated otherwise: A. Carapace, dorsal; B. Tip of left tarsus IV, lateral; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Left chela, setae omitted, dorsal, deutonymph paratype (FSCA, WM7707.01001). Scale lines = 0.5 mm (A, C, E); 0.1 mm (B, D).

1961, L.M. Smith (UCDC); 6 males, 5 tritonymphs, 5 deutonymphs, 1 protonymph, Jardin Botanico Nacional, Viña del Mar (33°00′S, 71°31′W), 16 May 1961, L.M. Smith (UCDC); 1 male, 1 tritonymph, 1 deutonymph, same data (WAM T130757).

Diagnosis.—*Albiorix chilensis* is one of the largest species of the genus, with a chela (without pedicel) length of greater than 1.6 mm. It differs from similarly sized species by the presence of only 20 trichobothria on the fixed chelal finger and hand (Figs. 5B, 9E, 9F), having only 5 setae on the cheliceral hand (Fig. 7B), having 6 setae on the anterior margin of the carapace (Fig. 9B), and the trichobothrium *t* region overlapping with the *est* region (Figs. 5B, 9E, 9F).

Description.—*Adult:* Color: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera (Fig. 7B): hand with 5 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 9 (male), 10 (female) small teeth; movable finger with 5 (male), 6 (female) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 9A): trochanter with scattered granulations, femur and patella lightly granulate on prolateral margin, chelal hand lightly granulate on prolateral surface at base of fingers; trochanter 1.85–2.20 (male), 2.23–2.41 (female), femur

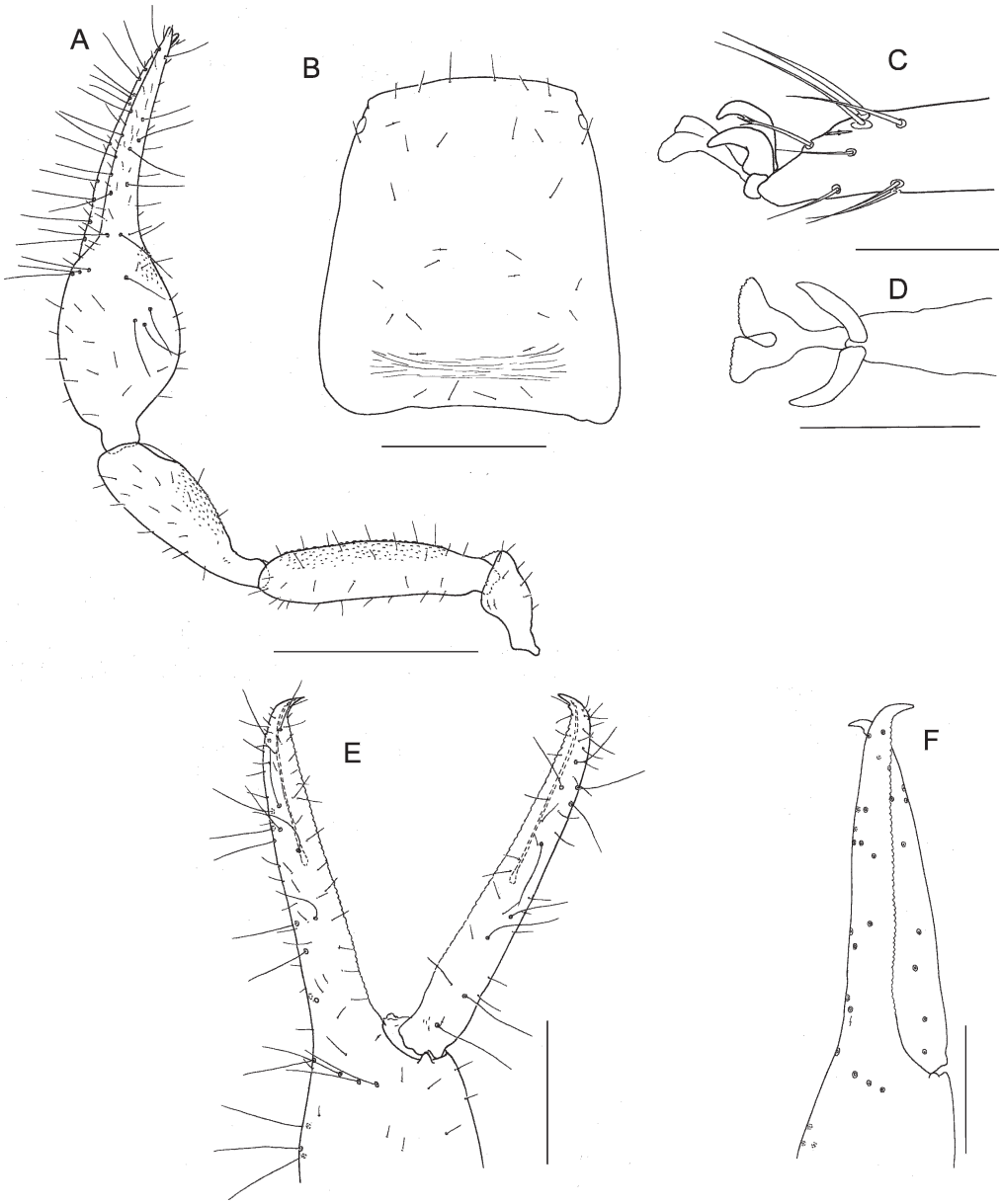

Figure 9.—*Albiorix chilensis* (Ellingsen), specimens from 1 km E. of Maitencillo (UCDC), unless stated otherwise: A. Left pedipalp, dorsal, male; B. Carapace, dorsal; C. Tip of left tarsus IV, lateral, male; D. Tip of left tarsus IV, dorsal, male; E. Right chela, lateral, female; F. Right chela, lateral, holotype female. Scale lines = 1.0 mm (A); 0.5 mm (B, E, F); 0.1 mm (C, D).

4.15–4.35 (male), 4.17–4.55 (female), patella 2.98–3.39 (male), 3.02–3.55 (female), chela (with pedicel) 3.48–3.76 (male), 3.40–3.62 (female), chela (without pedicel) 3.30–3.60 (male), 3.22–3.45 (female), hand (without pedicel) 1.35–1.47 (male), 1.30–1.49 (female) x longer than broad, movable finger 1.49–1.53 (male), 1.40–1.56 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 20 trichobothria, movable chelal finger with 10 trichobothria (Figs. 4D, 5B, 9E, 9F): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus basal to *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 54 (male), 50 (female) low, retrorse teeth; movable finger with 40 (male), 41 (female) low teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 9B): lateral margins evenly convex; 1.25–1.35 (male) 1.32 (female) x longer than broad; with 2 small bulging eyes; with 26 (male), 28 (female) setae including 6 setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 7: 6: 8: 6: 7 (male); 2 + 7: 6: 9: 7: 7 (female).

Legs: femur + patella 2.43 (male), 2.57 (female) x longer than deep; subterminal tarsal setae deeply bifurcate; arolium longer than claws, deeply divided (Figs. 9C, 9D).

Abdomen: tergites and sternites not divided; sclerites uniseriate. Tergal chaetotaxy: male (1 km E. of Maitencillo), 4: 6: 8: 7: 9: 8: 8: 8: 10: 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2; female (1 km E. of Maitencillo), 4: 6: 8: 8: 9: 10: 10: 10: 8: 8 (including 4 tactile setae): 8 (including 4 tactile setae): 2. Sternal chaetotaxy: male (1 km E. of Maitencillo), 15: (1) 16 [3 + 3] (1): (1) 10 (1): 11: 11: 11: 11: 12: 8: 14 (including 4 tactile setae): 2; female (1 km E. of Maitencillo), 10: (1) 6 (1): (1) 8 (1): 12: 10: 10: 11: 10: 11: 12 (including 4 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with large dorsal apodeme; median genital sac deeply bipartite; female with large gonosac, which is covered with scattered pores.

Dimensions (mm): Males: male from 1 km E. of Maitencillo followed by other males (where applicable): Body length 3.14 (3.30–3.39). Pedipalp: trochanter 0.538/0.244 (0.458–0.507/0.247–0.251), femur 1.181/0.283 (1.058–1.133/2.50–2.67), patella 1.040/0.347 (0.910–0.957/0.282–0.288), chela (with pedicel) 2.096/0.603 (1.840–1.955/0.494–0.520), chela (without pedicel) 1.992 (1.747–1.845), hand (without pedicel) length 0.816 (0.688–0.736), movable finger length 1.219 (1.056–1.12). Chelicera 0.531/0.264. Carapace 0.994/0.928 (but flattened) (0.939–0.973/0.720–0.760); eye diameter 0.051. Leg I: femur 0.558/0.147, patella 0.288/0.139, tibia 0.438/0.096, metatarsus 0.275/0.077, tarsus 0.307/0.055. Leg IV: femur + patella 0.948/0.390, tibia 0.686/0.179, metatarsus 0.352/0.117, tarsus 0.482/0.073.

Females: holotype followed by other female (where applicable): Body length 4.37. Pedipalp: trochanter 0.635/0.264 (0.638/0.286), femur 1.341/0.295 (1.309/0.314), patella 1.200/0.338 (1.120/0.371), chela (with pedicel) 2.275/0.629 (2.344/0.690), chela (without pedicel) 2.172 (2.224), hand (without pedicel) length 0.936 (0.896), movable finger length 1.312 (1.400). Chelicera 0.631/0.310. Carapace 1.182/0.898 (1.043/1.117, flattened); eye diameter 0.058. Leg I: femur ? (0.605/0.146), patella ? (0.320/0.144), tibia ? (0.498/0.103), metatarsus ? (0.291/0.084), tarsus ? (0.357/0.060). Leg IV: femur + patella ? (1.050/0.406), tibia ? (0.728/0.189), metatarsus ? (0.402/0.129), tarsus ? (0.518/0.081).

Tritonymph: Chelicera: galea long, slightly curved; hand with 5 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.14, femur 4.11, patella 3.07, chela (with pedicel) 3.76, chela (without pedicel) 3.56 × longer than broad. Fixed finger with 14 trichobothria, movable finger with 8 trichobothria (Fig. 4C); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria; *isb* and *sb* absent. Chelal hand with retrolateral condyle small and rounded.

Carapace: 1 pair of small eyes present; with 24 setae, including 6 setae on anterior margin and 4 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, sub-basal.

Legs: much as in adults.

Dimensions (mm): Body length 3.12. Pedipalp: trochanter 0.424/0.198, femur 0.880/0.214, patella 0.728/0.237, chela (with pedicel) 1.544/0.411, chela (without pedicel) 1.464, hand (without pedicel) length 0.568, movable finger length 0.928. Carapace 0.872/0.662.

Deutonymph: Chelicera: galea long, slightly curved; hand with 5 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 1.84, femur 3.27, patella 2.59, chela (with pedicel) 3.56, chela (without pedicel) 3.42 × longer than broad. Fixed finger with 9 trichobothria, movable finger with 6 trichobothria (Fig. 4B); *eb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 2 trichobothria; *ist* region with 2 trichobothria; *est* region with 2 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 4 trichobothria. Chelal hand with retrolateral condyle small and rounded.

Carapace: 1 pair of small eyes present; with 20 setae including 6 setae on anterior margin and 4 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, sub-basal.

Legs: much as in adult.

Dimensions (mm): Body length 2.26. Pedipalp: trochanter 0.320/0.174, femur 0.609/0.186, patella 0.557/0.215, chela (with pedicel) 1.229/0.345, chela (without pedicel) 1.181, hand (without pedicel) length 0.429, movable finger length 0.750. Carapace 0.634/width not determined.

Protonymph: Chelicera: galea long, nearly straight; hand with 4 setae, movable finger without seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.14, femur 3.95, patella 2.93, chela (with pedicel) 3.93, chela (without pedicel) 3.80 × longer than broad. Fixed finger with 3 trichobothria, movable finger with 1 trichobothrium (Fig. 4A); *eb*, *et*, *ist* and *t* present. Chelal hand with retrolateral condyle small and rounded.

Carapace: 1 pair of small eyes present; with 14 setae including 4 setae on anterior margin and 2 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure absent.

Legs: much as in adults.

Dimensions (mm): Body length 1.376. Pedipalp: trochanter 0.218/0.102, femur 0.435/0.110, patella 0.358/0.122, chela (with pedicel) 0.830/0.211, chela (without pedicel) 0.802, hand (without pedicel) length 0.266, movable finger length 0.531. Carapace 0.486/width not determined.

Remarks.—The holotype of *Ideobisium chilense* has been found to be lodged in MZUN and was examined for this study. The specimen is an adult female stored in ethanol and in good condition. The new specimens of *A. chilensis* reported here were collected some 100 km from the type locality of Santiago (Fig. 3D) and are generally in accord with the holotype. Mahnert (1984a) reported a specimen of *Albiorix* from Quebrada de la Plata, Santiago de Chile (33°30′S, 79°55′W), which is located only 25 km from the type locality, that was thought to represent a new species of *Albiorix*. Dr. Mahnert (in litt., June 2013) now confirms that the specimen is more likely to be a specimen of *A. chilensis*.

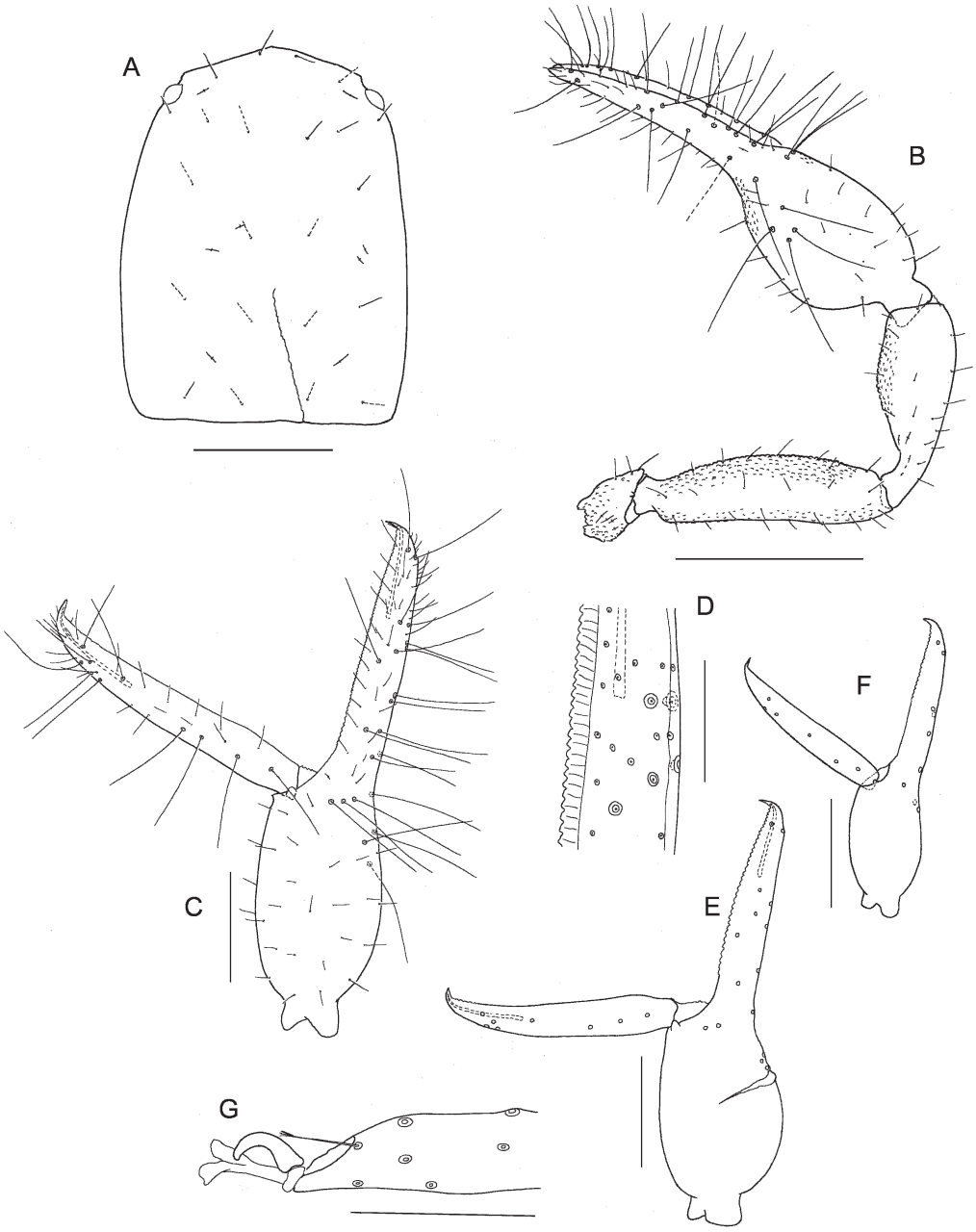

Figure 10.—*Albiorix conodentatus* Hoff, male holotype, unless stated otherwise: A. Carapace, dorsal; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Left chela, lateral, tritonymph (FSCA, WM4776.01006); F. Left chela, lateral, deutonymph (FSCA, WM4776.01007); G. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (B); 0.25 mm (A, C, E, F); 0.1 mm (D, G).

Albiorix conodentatus Hoff 1945
Figs. 3C, 10

Albiorix conodentatus Hoff 1945:8–10, Figs. 17–20; Harvey 1991:317; Ceballos 2004:427; Harvey 2013:unpaginated.
Albiorix retrodentatus Hoff: Hoff 1956:25–26 (misidentification).

Material examined.—*Holotype*. Mexico: *Coahuila de Zaragoza*: male, 5 miles W. of Saltillo (25°25′N, 101°05′W), 5 July 1936 [L.I.] Davis (AMNH, Hoff slide S–116.5204).

Other material. Mexico: *Chihuahua*: 1 female, Salaices (27°02′N, 105°13′W), 25 February 1966, J. Reddell, W. Bell (FSCA, WM902.01001); *Coahuila de Zaragoza*: 1 female, Cuatro Ciénegas (Minkley's Camp), Two Cave Canyon, 400 m E. of tip, Sierra San Marcos (26°59′N, 102°05′W), 11 August 1970, roof of small rock shelter, J.J. Landye (FSCA, WM7467.01001); *Nuevo León*: 1 female, near Gruta del Palmito, 7 km SSW. of Bustamante (26°30′N, 100°32′W), no date, Reddell (FSCA, WM974.01001); *Sonora*: 3 males, 3 females, San Miguel de Horcasitas (29°17′N, 110°52′W), no date, Eisen (MCZ, WM4535.01001–6); *Tamaulipas*: 1 female, 10 miles S. of Reynosa (25°55′N, 98°18′W), 6 November 1951, Creighton (AMNH, Hoff slide S–1967). USA: *New Mexico*: 1 male, Eddy County, ca. 14 km NE. of Loving (32°21′N, 103°58′W), 6 September 1991, under rock, dry soil, G. Lowe,

B. Hebert (WAM T127027); 1 male, Eddy County, Whites City (32°11′N, 104°23′W), 24 September 1950, W.J. Gertsch (AMNH, Hoff slide S–1582); 1 male, 1 female, Eddy County, Whites City, boundary Carlsbad Caverns National Park (32°11′N, 104°23′W), 6 September 1991, under rocks, G. Lowe (WAM T127028); *Texas*: 5 males, 2 females, 1 tritonymph, 1 deutonymph, Brewster County, Bullis Gap Range, Honeymoon (29°50′N, 102°37′W), 14 May 1977, C. Solieau (FSCA, WM4776.01001–9); 6 males, 5 females, Brewster County, Bullis Gap Range, ridge top (29°50′N, 102°37′W), 16 May 1977, C. Soileau (WAM T127030); 2 males, Brewster County, Chisos Mountains, Basin (29°16′N, 103°18′W), 28 May 1952, Cazier, Gertsch and Schrammel (AMNH, Hoff slide S–1961.1–2); 1 male, Brewster County, Chisos Mountains, Big Bend National Park (29°16′N, 103°18′W), 28 September 1950, W.J. Gertsch (AMNH, Hoff slide S–1580.2); 1 female, Brewster County, Hot Springs, Big Bend National Park (29°11′N, 103°00′W), 11 September 1950, W.J. Gertsch (AMNH, Hoff slide S–1589.1); 1 female, Hidalgo County, S. of Pharr (26°12′N, 98°11′W), 28 March 1936, S. Mulaik (AMNH, Hoff slide S–211); 1 male, 1 female, Jeff Davis County, Limpia Canyon, Fort Davis (30°47′N, 103°45′W), 27 March 1956, stream bed with ants, E.V. Gregg (AMNH, Hoff slide S–2740.1–2); 1 male, 1 female, Pecos County, 30 miles N. of Sanderson (30°34′N, 102°24′W), 3,450 feet, 5 September 1991, under rocks on slope, G. Lowe, B. Hebert (WAM T127029); 1 male, Terrell County, Sanderson (30°08′N, 102°24′W), 26 May 1952, Cazier, Gertsch and Schrammel (AMNH, Hoff slide S–1964); 7 males, 7 females, Upton County, 7 miles NE. of Crane, McElroy Ranch (31°29′N, 102°18′W), 20 June 1986, D. Sissom, M. Hulsey (FSCA, WM7601); 2 males, 2 females, Val Verde County, 3 miles N. of Langtry (29°51′N, 101°33′W), 3 November 1984, J. Reddell, M. Reyes (FSCA, WM6769); 4 males, 2 females, Val Verde County, rim of Pecos River Canyon, 3 miles from mouth (29°44′N, 101°21′W), 25 June 1947, C.L. Remington (PMNH, WM3326.01001–6); 3 males, 1 female, 1 deutonymph, Val Verde County, Seminole Canyon State Park (29°41′N, 101°19′W), 4 November 1984, J. Reddell (FSCA, WM6768); 1 female, Val Verde County, Shumla (29°47′N, 101°24′W), 26 May 1952, Cazier, Gertsch and Schrammel (AMNH, Hoff slide S–1960.1).

Diagnosis.—*Albiorix conodentatus* differs from other species of the genus by the small, tightly spaced chelal teeth of the fixed chelal finger (Fig. 10D), and the position of trichobothrium est_4 which is situated basally, where it overlaps with the *ist* group.

Description.—*Adult:* Color: pedipalps, carapace and coxal region red-brown; abdomen pale red-brown; chelicerae and legs light yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae, very occasionally 5 or 7 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 4 (male), 4 (female) small teeth; movable finger with 3 (male), 6 (female) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 10B): trochanter with scattered granulations on most faces, femur granulate on prolateral and basal region of retrolateral margins, patella finely granulate on prolateral margin, chelal hand very sparsely granulate on prolateral margin at base of fingers; trochanter 2.26–2.54 (male), 2.11–2.47 (female), femur 3.59–4.11 (male), 3.52–4.05 (female), patella 2.60–3.00 (male), 2.41–2.90 (female), chela (with pedicel) 3.29–3.59 (male), 2.92–3.54 (female), chela (without pedicel) 3.14–3.36 (male), 2.81–3.31 (female), hand (without pedicel) 1.35–1.55 (male), 1.31–1.85 (female) x longer than broad, movable finger 1.18–1.40 (male), 1.16–1.37 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Figs. 5C, 10C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria, est_4 situated basally, overlapping with *ist* group; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus basal to *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth closely spaced: fixed finger with 44–57 (male), 45–55 (female) closely spaced, triangular retrorse teeth (Fig. 10D); movable finger with several obvious teeth, followed by a series of indistinct very low teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 10A): lateral margins evenly convex; 1.16–1.40 (male), 1.12–1.39 (female), x longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with 21–24 (male), 20–24 (female) setae, including 4 (3 in 1 male) on anterior margin and 4 (very rarely 5 or 6) on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 8: 5: 5: 6: 6 (♂); 2 + 7: 5: 6: 6: 6 (female).

Legs: femur + patella 2.34–2.73 (male), 2.53–2.77 (female) x longer than deep; subterminal tarsal setae trifurcate (Fig. 10G); arolium longer than claws, deeply divided.

Abdomen: tergites not divided, medial sternites without medial suture line; sclerites uniseriate. Tergal chaetotaxy: male, 4: 5: 6: 8: 8: 8: 8: 8: 8: 7 (including 4 tactile setae): 5 (including 3 tactile setae): 2; female, 4: 5: 8: 8: 7: 8: 8: 8: 8: 7: 5 (including 2 tactile setae): 2. Sternal chaetotaxy: male, 9: (1) 13 [3 + 3] (1): (1) 7 (1): 10: 11: 11: 11: 11: 9: 9 (including 4 tactile setae): 2; female, 6: (1) 8 (1): (1) 7 (1): 10: 11: 10: 10: 11: 11: 8 (including 4 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac deeply bipartite; female with large gonosac which is covered with scattered pores.

Dimensions (mm): Males: holotype followed by other males (where applicable): Body length 2.33 (2.26–2.74). Pedipalp: trochanter ? (damaged)/0.142 (0.323–0.392/0.133–0.170), femur 0.686/0.173 (0.672–0.815/0.174–0.216), patella 0.555/0.201 (0.561–0.665/0.186–0.235), chela (with pedicel) 1.188/0.344 (1.156–1.344/0.321–0.395), chela (without pedicel) 1.116 (1.090–1.265), hand (without pedicel) length 0.477 (0.477–0.585), movable finger length 0.646 (0.608–0.720). Chelicera

0.293/0.149; movable finger length 0.149. Carapace 0.672/0.512 (0.632–0.815/0.494–0.656); eye diameter 0.038. Leg I: femur 0.321/0.091, patella 0.180/0.089, tibia 0.239/0.064, metatarsus 0.149/0.051, tarsus 0.245/0.042. Leg IV: femur + patella 0.557/0.238 (0.525–0.627/0.198–0.250), tibia 0.392/0.097, metatarsus 0.206/0.071, tarsus 0.300/0.034.

Females: specimen from Gruta del Palmito (FSCA, WM974.01001) followed by other females (where applicable): Body length 2.85 (2.63–4.32). Pedipalp: trochanter 0.378/0.160 (0.339–0.467/0.150–0.189), femur 0.800/0.198 (0.682–0.980/0.182–0.248), patella 0.614/0.213 (0.557–0.765/0.202–0.267), chela (with pedicel) 1.402/0.410 (1.179–1.608/0.361–0.475), chela (without pedicel) 1.312 (1.102–1.507), hand (without pedicel) length 0.570 (0.483–0.667), movable finger length 0.736 (0.642–0.864). Chelicera 0.358/0.169. Carapace 0.714/0.585 (but somewhat flattened) (0.627–0.896/0.518–0.720); eye diameter 0.046. Leg I: femur 0.365/0.105, patella 0.186/0.097, tibia 0.276/0.072, metatarsus 0.167/0.055, tarsus 0.246/0.045. Leg IV: femur + patella 0.615/0.243 (0.531–0.752/0.192–0.287), tibia 0.438/0.110, metatarsus 0.242/0.080, tarsus 0.334/0.054.

Tritonymph: Chelicera: galea long, slightly curved; hand with 6 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.30, femur 3.58, patella 2.63, chela (with pedicel) 3.43, chela (without pedicel) 3.22 × longer than broad. Fixed finger with 15 trichobothria, movable finger with 8 trichobothria (Fig. 10E); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 5 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria; *isb* and *sb* absent. Chelal hand with retrolateral condyle small and rounded.

Carapace: anterior margin medially prominent; 1 pair of small eyes present; with 22 setae, including 4 setae on anterior margin and 4 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, subbasal.

Legs: much as in adults.

Dimensions (mm): Body length ? (damaged). Pedipalp: trochanter 0.288/0.125, femur 0.572/0.160, patella 0.436/0.166, chela (with pedicel) 0.972/0.283, chela (without pedicel) 0.910, hand (without pedicel) length 0.381, movable finger length 0.544. Carapace 0.559/? (distorted).

Deutonymph: Chelicera: galea long, slightly curved; hand with 5 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.03, femur 3.61, patella 2.45, chela (with pedicel) 3.82, chela (without pedicel) 3.64 × longer than broad. Fixed finger with 9 trichobothria, movable finger with 6 trichobothria (Fig. 10F); *eb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 2 trichobothria; *ist* region with 2 trichobothria; *est* region with 2 trichobothria; *et* slightly distal to *it*; *esb* and *isb* absent; *b* region with 2 trichobothria; *t* region with 4 trichobothria; *sb* and *st* absent. Chelal hand with retrolateral condyle small and rounded.

Carapace: anterior margin medially prominent; 1 pair of small eyes present; with 16 setae, including 4 setae on anterior margin and 2 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, subbasal.

Legs: much as in adults.

Dimensions (mm): Body length 1.62. Pedipalp: trochanter 0.193/0.095, femur 0.394/0.109, patella 0.282/0.115, chela (with pedicel) 0.688/0.180, chela (without pedicel) 0.688, hand (without pedicel) length 0.256, movable finger length 0.384. Carapace 0.436/0.310.

Remarks.—*Albiorix conodentatus* occurs throughout southern Texas and New Mexico, and northern Mexico (Fig. 3C). Although the label accompanying the slide-mounted holotype of *A. conodentatus* gives the collection site as ''Saltillo'', the original description by Hoff (1945) gave a more precise location of ''5 miles W. of Saltillo''. Both the label and publication failed to specify in which state of Mexico the locality was situated. In a series of papers co-authored by the collector (L.I. Davis), it is unequivocally confirmed that the location is situated in the state of Coahuila de Zaragoza (e.g., see Gertsch & Davis 1937, p. 2). Hoff (1956) identified two specimens from Eddy County, New Mexico as *A. retrodentatus*. We have examined one of these specimens (from Whites City, erroneously called White City by Hoff) and found that it conforms very closely to specimens of *A. conodentatus*.

Albiorix edentatus Chamberlin 1930
Figs. 3A, 11

Albiorix edentatus Chamberlin 1930:46–47, figs 1C, 2Y, AA; Chamberlin 1931:figs 28l, 33q; Beier 1932a:173; Roewer 1936:Fig. 30a; Roewer 1937:257; Hoff 1958:15; Harvey 1991:317; Harvey 2013:unpaginated.

Material examined.—*Holotype*. USA: *California*: male, Santa Isabella Creek, east slope of Mt. Hamilton, Santa Clara County (37°21′N, 121°39′W), 18 May 1924, under stones (under large boulders on yellow pine-covered hillside), J.C. Chamberlin (CAS, Entomology Type No. 17457, JC–266.01003).

Paratypes. USA: *California*: 4 tritonymphs, same data as holotype (CAS, JC–266.01001, 2, 4, 5).

Diagnosis.—*Albiorix edentatus* resembles *A. rosario* in having very low teeth of the fixed chelal finger that are much longer than high (Fig. 11D). It differs from *A. rosario* in having trifurcate subterminal tarsal setae (Fig. 11F) and in having trichobothria b_2, *sb* and *st* equidistant from each other (Fig. 11C).

Description.—*Adult:* Color: pedipalps, carapace and coxal region red-brown; abdomen pale red-brown; chelicerae and legs light yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: both chelicerae not present on slide.

Pedipalp (Fig. 11B): trochanter with scattered granulations, especially on retrolateral face, femur and patella lightly granulate on prolateral faces, chelal hand lightly granulate on prolateral surface at base of fingers; trochanter 2.36 (male), femur 4.36 (male), patella 3.23 (male), chela (with pedicel) 3.86 (male), chela (without pedicel) 3.63 (male), hand (without pedicel) 1.44 (male) x longer than broad, movable finger 1.49 (male) x longer than hand (without pedicel). Fixed chelal finger and hand with 21 trichobothria, movable chelal finger with 10 trichobothria (Figs. 5D, 11C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et*

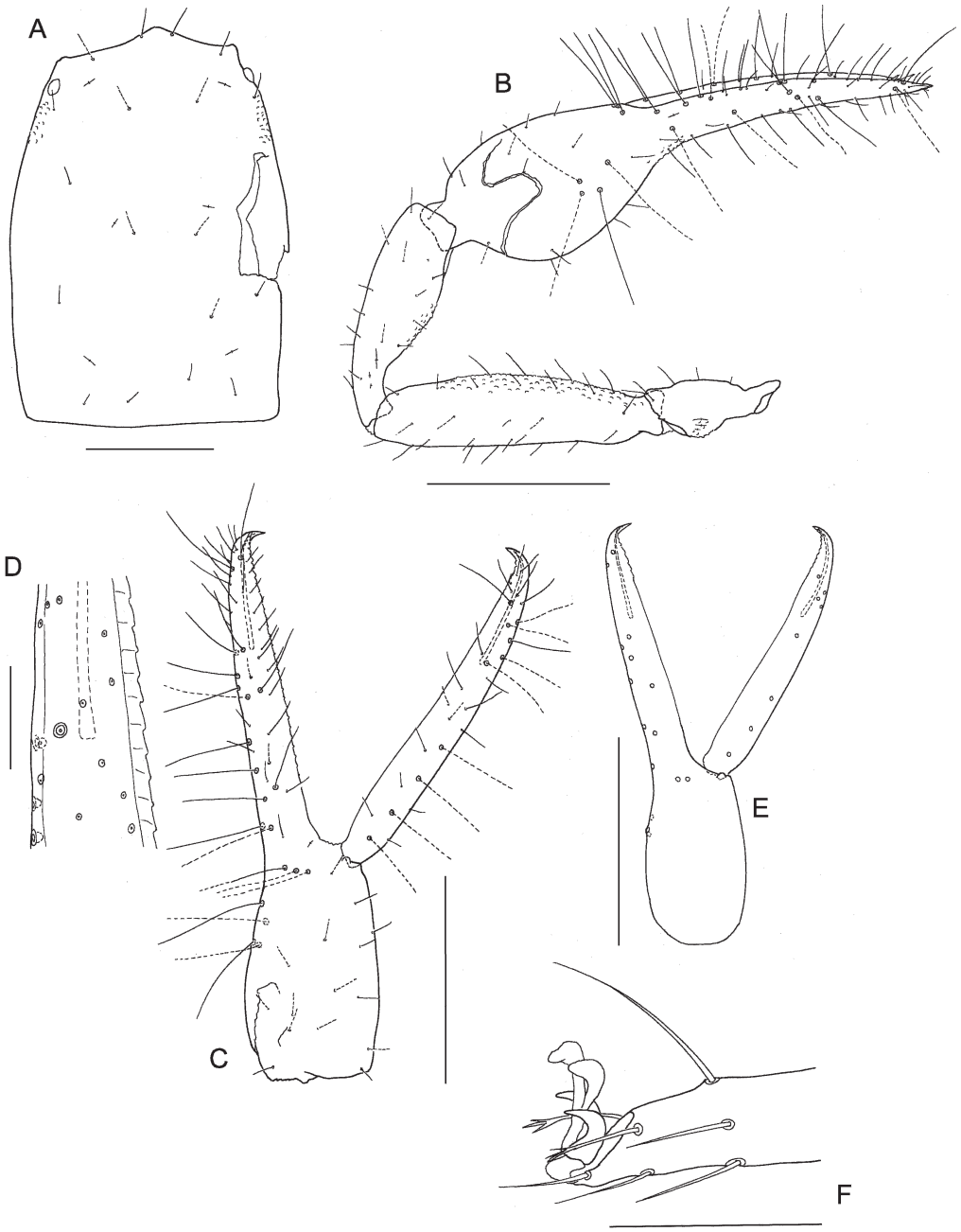

Figure 11.—*Albiorix edentatus* Chamberlin, male holotype, unless stated otherwise: A. Carapace; B. Left pedipalp, dorsal; C. Right chela, lateral; D. Detail of fixed chelal finger; E. Right chela, lateral, tritonymph paratype; F. Tip of right tarsus IV. Scale lines = 0.5 mm (B, C, E); 0.25 mm (A); 0.1 mm (D, F).

slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus at *est* region in fixed finger and base of *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 31 (male) very low, retrorse teeth, each much longer than high (Fig. 11D); movable finger with ca. 10 (male) very low, rounded teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 11A): lateral margins evenly convex; 1.48 (male) x longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with of 18 (male) setae including 4 setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 8: 4: 4: 4: 6 (male).

Legs: femur + patella 2.38 (male) x longer than deep; subterminal tarsal setae trifurcate; arolium longer than claws, deeply divided.

Abdomen: tergites and sternites not divided; sclerites uniseriate. Tergal chaetotaxy: male, 4: 5: 6: 6: 6: 6: 6: 6: 6: 6

(including 2 tactile setae): 9 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 8: (1) 9 [3 + 3] (1): (1) 6 (1): 9: 9: 9: 8: 8: 10 (including 2 tactile setae): 6 (including 2 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac bipartite and each arm fairly short.

Dimensions (mm): Males: holotype: Body length not measurable. Pedipalp: trochanter 0.371/0.157, femur 0.824/0.189, patella 0.629/0.195, chela (with pedicel) 1.458/0.378, chela (without pedicel) 1.373, hand (without pedicel) length 0.546, movable finger length 0.816. Chelicera ? (both missing from slide). Carapace 0.784/0.528; eye diameter 0.038. Leg I: femur 0.381/0.102, patella 0.144/0.098, tibia 0.293/0.077, metatarsus 0.102/0.058, tarsus 0.267/0.044. Leg IV: femur + patella 0.632/0.266, tibia 0.461/0.116, metatarsus 0.227/0.083, tarsus 0.332/0.054.

Tritonymph: Chelicera: galea long, slightly curved; hand with 5 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.20, femur 4.03, patella 2.77, chela (with pedicel) 3.88, chela (without pedicel) 3.69 × longer than broad. Fixed finger with 15 trichobothria, movable finger with 8 trichobothria (Fig. 11E); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 5 trichobothria; *et* slightly distal to *it*; *isb* absent; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria; *sb* absent. Chelal hand with retrolateral condyle small and rounded.

Carapace: anterior margin medially prominent; 1 pair of small eyes present; with 18 setae including 4 setae on anterior margin and 4 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, sub-basal.

Legs: much as in adults.

Dimensions (mm): Body length 2.06. Pedipalp: trochanter 0.275/0.125, femur 0.613/0.152, patella 0.446/0.161, chela (with pedicel) 1.093/0.282, chela (without pedicel) 1.040, hand (without pedicel) length 0.397, movable finger length 0.638. Carapace 0.640/? (distorted).

Remarks.—The original meagre description of *A. edentatus* by Chamberlin (1930) was based on the male holotype and four tritonymphs, which he erroneously suggested may have been immature females. The slide-mounted holotype lacks the chelicerae, which were presumably lost during preparation of the specimen.

This species has only been reported from the type locality in central California (Fig. 3A).

Albiorix gertschi Harvey & Muchmore sp. nov.
Figs. 3A, 12

Albiorix mexicanus Chamberlin 1930:45 (in part, specimens from Utah).

Material examined.—*Holotype*. USA: *Utah*: female, Grand County, Moab (38°34′N, 109°33′W), 9 May 1932, W.J. G[ertsch] (CAS, JC–1607.01003).

Paratypes. USA: *Utah*: 1 male, 1 female, collected with holotype (CAS, JC–1607.01001–2); 1 female, Emery County, Ferron (39°06′N, 111°08′W), 23 June 1934, W. Ivie (CAS, JC–1619.02001); 1 male, Emery County, Straight Wash (38°47′N, 110°28′W), 20 April 1928, W.J.G[ertsch] (CAS, JC–449.01001).

Other material. USA: *Arizona*: 2 males, 1 female, Coconino County, Grand Canyon, Colorado River-side, mile 43.2 (36°03′N, 112°09′W), 16–17 October 1982, V. Roth (FSCA, WM7351); 1 male, 1 female, same data (WAM T129657); *Nevada*: 1 male, Pershing County, Lovelock (40°11′N, 118°28′W), 4 May 1941 (MCZ, WM1997.01001).

Diagnosis.—*Albiorix gertschi* closely resembles *A. vigintus* and *A. sarahae* in having trichobothrium ib_5 situated distally (Fig. 12B), but unlike these species which have 20 and 21 trichobothria on the fixed chelal finger and hand, respectively, it has 22 trichobothria (Fig. 12C), with 6 trichobothria in the *ist* group.

Description.—*Adult:* Color: pedipalps, coxae and carapace deep yellow-brown, legs and chelicerae pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 4 (male), 5 (female) small teeth; movable finger with 6 (male), 5 (female) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 12B): trochanter with scattered granulations, femur lightly granulate on prolateral and retrolateral margins, patella lightly granulate on prolateral margin, chelal hand lightly granulate on prolateral surface at base of fingers; trochanter 2.48–2.56 (male), 2.40–2.59 (female), femur 4.57–5.01 (male), 4.31–4.81 (female), patella 3.32–3.85 (male), 2.91–3.48 (female), chela (with pedicel) 3.99–4.47 (male), 3.58–4.45 (female), chela (without pedicel) 3.78–4.24 (male), 3.49–4.23 (female), hand (without pedicel) 1.53–1.64 (male), 1.50–1.66 (female) x longer than broad, movable finger 1.43–1.69 (male), 1.29–1.54 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Figs. 5E, 12C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria, ib_5 displaced distally in advance of *eb*, *esb* and *isb*; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus within *est* region in fixed finger and at base of *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 57 (male), 42–47 (female) low, retrorse teeth (Fig. 12D); movable finger with ca. 12–20 (male), ca. 12 (female) obvious, low teeth, followed by additional very low teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 12A): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 20–23 (male), 20 (female) setae including 4 (5 in 1 male) setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 7: 5: 6: 5: 6 (male); 2 + 8: 4: 6: 5: 6 (female).

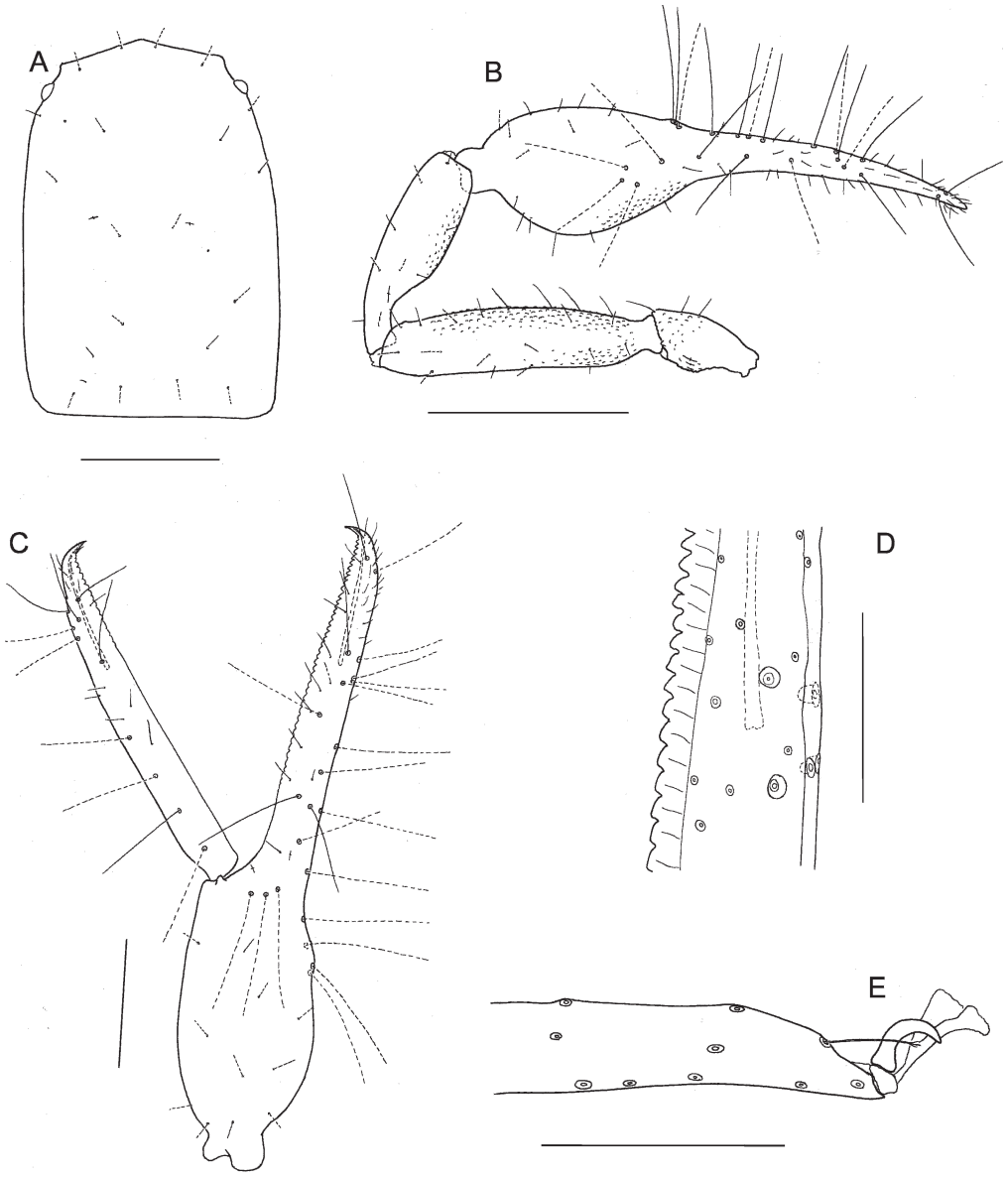

Figure 12.—*Albiorix gertschi* Harvey & Muchmore sp. nov.: female holotype, unless stated otherwise: A. Carapace; B. Left pedipalp, dorsal; C. Left chela, lateral, paratype female (CAS, JC–1607.01002); D. Detail of fixed chelal finger, paratype female (CAS, JC–1607.01002); E. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (B); 0.25 mm (A, C); 0.1 mm (D, E).

Legs: femur + patella 2.54 –2.85 (male), 2.82–2.85 (female) x longer than deep; subterminal tarsal setae trifurcate (Fig. 12E); arolium longer than claws, deeply divided.

Abdomen: tergites and sternites not divided; sclerites uniseriate. Tergal chaetotaxy: male, 4: 5: 7: 8: 8: 8: 7: 8: 6: 6 (including 2 tactile setae): 7 (including 4 tactile setae): 2; female, 4: 4: 5: 7: 8: 8: 8: 8: 6: 7 (including 4 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: male, ? (sternite missing): (1) 8 [3 + 3] (1): (1) 7 (1): 10: 8: 9: 8: 8: 6: 6 (including 2 tactile setae): 2; female, 6: (1) 6 (1): (1) 7 (1): 9: 9: 10: 9: 8: 8: 8 (including 4 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac deeply bifid; female with large gonosac which is covered with scattered pores.

Dimensions (mm): Males: JC–1607.01001 followed by other males (where applicable): Body length 2.06 (2.18–2.32). Pedipalp: trochanter 0.317/0.128 (0.397/0.155–0.156), femur 0.690/0.151 (0.850–0.940/0.179–0.195), patella 0.531/0.160 (0.646–0.730/0.179–0.195), chela (with pedicel) 1.187 (1.456–1.578/0.331–0.378), chela (without pedicel) 1.144 (1.402–1.503), hand (without pedicel) length 0.467 (1.530–1.640), movable finger length 0.669 (0.864–0.948). Chelicera 0.264/0.113; movable finger length 0.113. Carapace 0.640/0.411 (0.779–0.925/0.563–0.602); eye diameter 0.038. Leg I: femur 0.341/0.080, patella 0.167/0.076, tibia 0.260/0.058, metatarsus 0.153/0.045, tarsus 0.250/0.038. Leg IV: femur + patella 0.523/0.198 (0.656–0.672/0.236–0.258), tibia 0.382/0.083, metatarsus 0.186/0.062, tarsus 0.298/0.042.

Females: holotype followed by other females (where applicable): Body length 2.29 (1.94–2.03). Pedipalp: trochanter

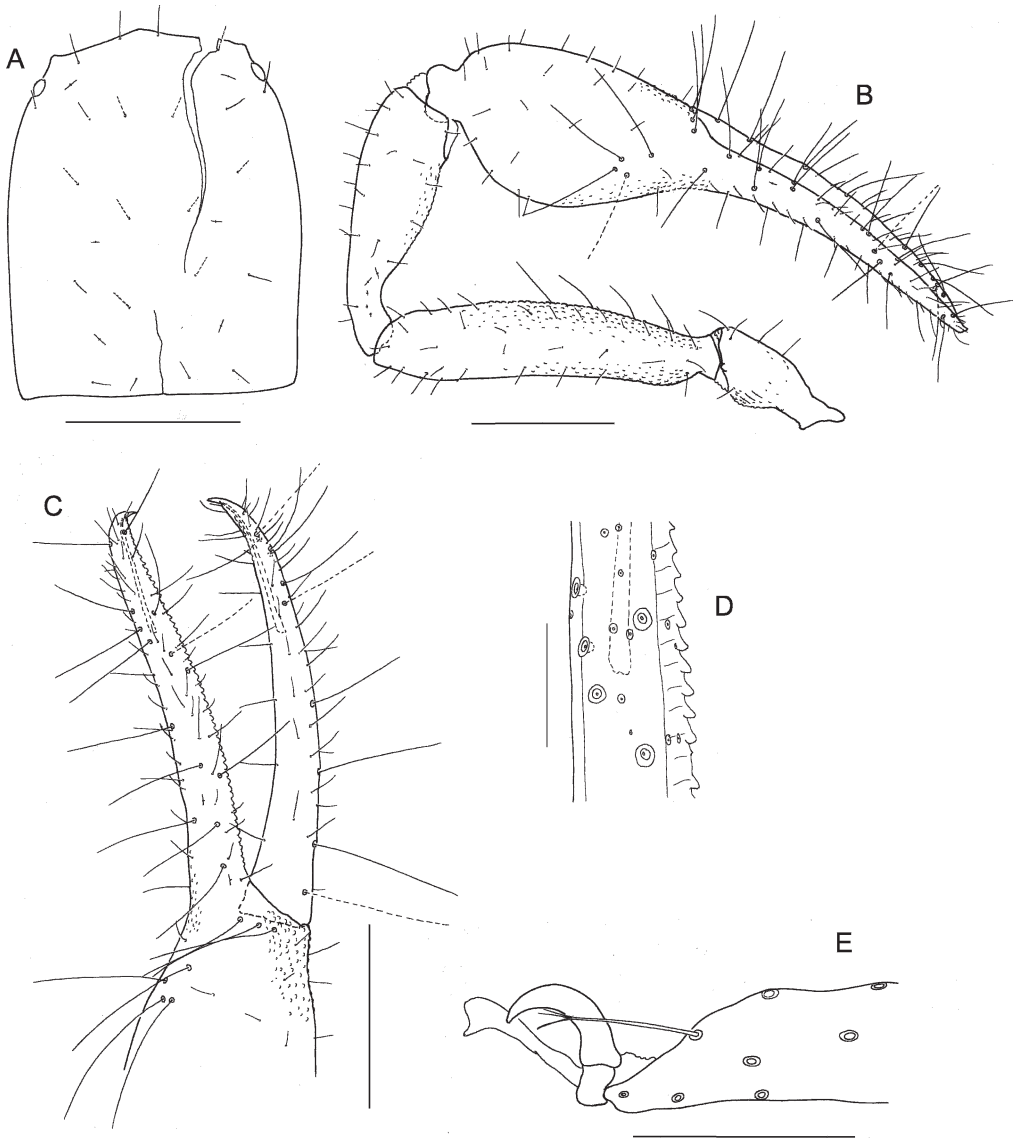

Figure 13.—*Albiorix magnus* Hoff, female holotype: A. Carapace; B. Left pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (A–C); 0.1 mm (D, E).

0.347/0.134 (0.338–0.384/0.141–0.151), femur 0.726/0.161 (0.736–0.904/0.153–0.191), patella 0.539/0.162 (0.544–0.662/0.162–0.205), chela (with pedicel) 1.267/0.316 (1.280–1.541/0.314–0.371), chela (without pedicel) 1.205 (1.219–1.480), hand (without pedicel) length 0.486 (0.486–0.589), movable finger length 0.720 (0.728–0.885). Chelicera 0.290/0.124; movable finger 0.179. Carapace 0.659/0.475 (0.642–0.762/0.460–0.528); eye diameter 0.038. Leg I: femur 0.352/0.085, patella 0.180/0.077, tibia 0.266/0.060, metatarsus 0.160/0.050, tarsus 0.256/0.038. Leg IV: femur + patella 0.551/0.193 (0.545–0.602/0.193–0.211), tibia 0.411/0.088, metatarsus 0.205/0.063, tarsus 0.314/0.041.

Remarks.—This species is known from desert ecosystems in Utah, Nevada and northern Arizona (Fig. 3A).

Etymology.—This species is named for the late Willis J. Gertsch (1906–1998), former curator of the American Museum of Natural History, New York, and collector of some of the type specimens.

Albiorix magnus Hoff 1945
Figs. 3B, 13

Albiorix magnus Hoff 1945:2–4, figs 1–5; Harvey 1991:317; Ceballos 2004:427; Harvey 2013:unpaginated.
Albiorix aff. *magnus* Hoff: Villegas-Guzman 2006:134.

Material examined.—*Holotype*. MEXICO: *Coahuila de Zaragoza:* female, 20 miles E. of San Pedro (25°45′N, 102°52′W), 5 July 1936, A.M. Davis, L.I. Davis (AMNH, Hoff slide no. S–119.5207).

Diagnosis.—This is one of the largest species of the genus, which differs from others of similar size as follows: from *A. anophthalmus* by the presence of eyes (Fig. 13A); from *A. chilensis* by the presence of 6 setae on the cheliceral hand; from *A. meraculus* by the trifurcate subterminal tarsal seta (Fig. 13E); and from *A. oaxaca* by having fewer and larger teeth on the fixed chelal finger (Fig. 13D).

Description.—*Adult:* Color: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate, slightly curved; fixed finger with 9 (female) teeth; movable finger with 6 (female) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 13B): trochanter lightly granulate on prolateral and retrolateral faces, femur lightly granulate over most surfaces but with stronger granulations on prolateral face, patella lightly granulate on prolateral face, chela with light granulations on prolateral face, and retrolateral face near base of chelal fingers, and otherwise smooth; trochanter 2.38 (female), femur 4.54 (female), patella 3.36 (female), chela (with pedicel) 3.86 (female), chela (without pedicel) 3.69 (female), hand (without pedicel) 1.51 (female) x longer than broad, movable finger 1.47 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Figs. 5F, 13C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus within *est* region in fixed finger and basal to the *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 54 (female) retrorse, close-set teeth (Fig. 13D); movable finger with ca. 9 distal teeth, leading into several very low teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 13A): lateral margins evenly convex; 1.23 (female) x longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with 22 setae including 4 setae on anterior margin and 4 on posterior margin; with shallow furrow situated near posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 9: 6: 7: 7: 7 (female).

Legs: femur + patella 2.78 (female) x longer than deep; metatarsus and tarsus III and IV with sub-basal tactile seta; subterminal tarsal setae trifurcate (Fig. 13E); arolium longer than claws, deeply divided.

Abdomen: tergites and sternites not divided; sclerites uniseriate or nearly so, except for except for female sternite V which has 2 setae not in main row. Tergal chaetotaxy: female, 5: 6: 6: 8: 8: 8: 8: 8: 8: 8 (including 3 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: female, 10: (1) 8 (1): (1) 8 (1): 14: 12: 12: 10: 9: 11: 7 (including 2 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: female with large gonosac, which is covered with scattered pores.

Dimensions (mm): Female: holotype: Body length 3.39. Pedipalp: trochanter 0.531/0.223, femur 1.190/0.262, patella 0.947/0.282, chela (with pedicel) 2.048/0.531, chela (without pedicel) 1.960, hand (without pedicel) length 0.804, movable finger length 1.184. Chelicera 0.437/0.204, movable finger length 0.259. Carapace 0.989/0.802; eye diameter 0.051. Leg I: femur 0.560/0.131, patella 0.262/0.122, tibia 0.449/0.083, metatarsus 0.225/0.070, tarsus 0.358/0.052. Leg IV: femur + patella 0.884/0.318, tibia 0.624/0.126, metatarsus 0.353/0.093, tarsus 0.486/0.066.

Remarks.—The right chela of the slide-mounted holotype has been separated from the remainder of the pedipalp, but is not positioned in such a way as to allow the morphology of the chelal teeth to be observed properly. Although the chela is rotated slightly and is dorso-laterally aligned (Fig. 13C), it appears that the teeth of the fixed finger may be basally incised, as in the types of *A. meraculus* (Fig. 14D), as a slight overlap can be observed in many of the teeth. However, both species can be distinguished by the morphology of the subterminal tarsal setae, which are trifurcate in *A. magnus* (Fig. 13E) but are bifurcate *A. meraculus*.

The original description of *A. magnus* by Hoff (1945) gave the type locality as ''20 miles E. of San Pedro'' even though the label accompanying the slide-mounted holotype simply stated ''San Pedro''. Hoff (1945) did not specify in which state of Mexico this particular San Pedro was situated, but in a series of papers co-authored by one of the collectors (L.I. Davis), they unequivocally confirm that the location is situated in the state of Coahuila de Zaragoza (e.g., see Gertsch & Davis 1937, p. 2). Villegas-Guzmán (2006) recorded several specimens from Chiapas, Mexico as *Albiorix* affinis *magnus*, but noted discrepancies with the original description by Hoff (1945) and suggested that they may in fact represent an undescribed species. Dr Villegas-Guzmán (in litt.) has kindly reexamined the specimens which are lodged in the Colección Nacional de Arácnidos del Instituto de Biología de la Universidad Nacional Autónoma de México, and confirms that they match the new description of *A. magnus* presented in this manuscript.

Albiorix magnus appears to be widely distributed in Mexico and has been found at the type locality in the state of Coahuila de Zaragoza and in eastern Chiapas near the Guatemalan border (Fig. 3B).

Albiorix meraculus Harvey & Muchmore, sp. nov.
Figs. 3B, 14

Material examined.—*Holotype.* MEXICO: *Jalisco*: Male, Purificación (19°43′N, 104°36′W), 19 November 1941, C. Bolivar (CAS, JC–1658.01001).

Paratype. MEXICO: *Jalisco*: 1 tritonymph, same data as holotype (CAS, JC–1658.01002).

Diagnosis.—*Albiorix meraculus* is one of the largest species of *Albiorix*, with a chela length (with pedicel) of 2.032 mm (male). It differs from other species of the genus by the morphology of the teeth on the fixed chelal finger, most of which are deeply incised basally forming an overhanging ridge. In addition, the subterminal tarsal seta is bifurcate and each tine is quite long.

Description.—*Adult:* Color: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate, slightly curved;

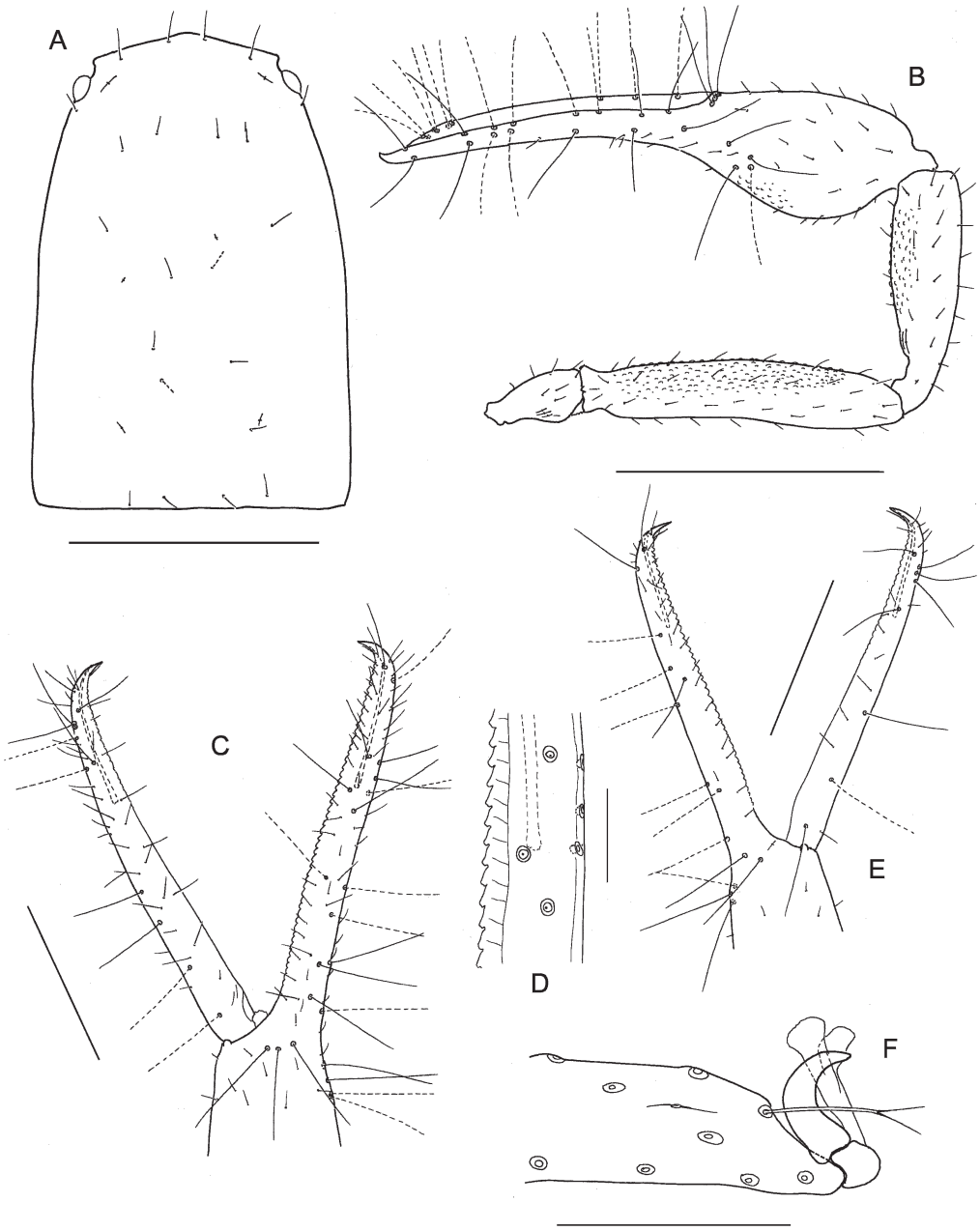

Figure 14.—*Albiorix meraculus* Harvey & Muchmore sp. nov., male holotype, unless stated otherwise: A. Carapace, dorsal; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Right chela, lateral, tritonymph paratype (CAS, JC–1658.01002); F. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 1.0 mm (B); 0.5 mm (A, C, E); 0.1 mm (D, F).

fixed finger with 6 small teeth as well as several minute teeth; movable finger with 4 teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 14B): trochanter lightly granulate on retrolateral face, femur lightly granulate over most surfaces, patella lightly granulate over prolateral face, chela fairly smooth; femur 5.25 (male), patella 3.51 (male), chela (with pedicel) 4.49 (male), chela (without pedicel) 4.34 (male), hand (without pedicel) 1.62 (male) x longer than broad, movable finger 1.64 (male) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 14C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 7 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and basal to the *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 58 (male) strongly retrorse teeth, margins of most

teeth deeply dissected basally forming an overhanging ridge; movable finger with several distal teeth none of which are upraised, leading into many very low teeth which extend along entire length of finger; base of fixed chelal finger with several small denticles.

Carapace (Fig. 14A): lateral margins evenly convex; 1.47 (male) x longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with 22 setae including 4 setae on anterior margin and 4 on posterior margin; without furrows.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 8: 8: 7: 8: 9 (male).

Legs: femur + patella 2.53 (male) x longer than deep; metatarsus and tarsus III and IV with sub-basal tactile seta; subterminal tarsal setae bifurcate with long tines (Fig. 14F); arolium longer than claws, deeply divided (Fig. 14F).

Abdomen: tergites and sternites not divided, except for sternite III, which is medially divided; sclerites uniseriate, except for sternites II and III, which have the setae somewhat scattered. Tergal chaetotaxy, male: 4: 6: 6: 8: 8: 8: 10: 8: 8: 8 (including 2 lateral tactile setae): 9 (including 4 tactile setae): 2. Sternal chaetotaxy, male: 15: (1) 18 [2 + 3] (1): (1) 9 (1): 10: 13: 9: 11: 11: 11: 9 (including 4 tactile setae): 3. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with small dorsal apodeme; median genital sac bipartite and each arm fairly short.

Dimensions (mm): Male: holotype (JC–1658.01001): Body length ca. 3.12. Pedipalp: trochanter ? (damaged)/0.193, femur 1.192/0.227, patella 0.898/0.256, chela (with pedicel) 2.032/0.453, chela (without pedicel) 1.968, hand (without pedicel) length 0.736, movable finger length 1.208. Chelicera 0.368/0.158, movable finger length 0.224. Carapace 0.960/0.651; eye diameter 0.061. Leg I: femur 0.560/0.126, patella 0.264/0.109, tibia 0.447/0.083, metatarsus 0.231/0.064, tarsus 0.371/0.046. Leg IV: femur + patella 0.909/0.359, tibia 0.650/0.136, metatarsus 0.325/0.097, tarsus 0.466/0.061.

Tritonymph: Chelicera: galea long, slightly curved; hand with 6 setae, movable finger with 1 seta; fixed finger with 6 small teeth, movable finger with 3 small teeth; rallum composed of 4 blades, all serrate.

Carapace: anterior margin medially prominent; 1 pair of rounded eyes present; with 22 setae including 4 setae on anterior margin and 4 setae on posterior margin.

Pedipalp: trochanter 2.24, femur 5.27, patella 3.54, chela (with pedicel) 4.57, chela (without pedicel) 4.40, hand (without pedicel) 1.61 × longer than broad; movable finger 1.69 × longer than hand (without pedicel). Fixed finger with 14 trichobothria, movable finger with 8 trichobothria (Fig. 14E); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria. Chelal hand with retrolateral condyle small and rounded.

Legs: much as in adult.

Dimensions (mm): Body length ca. 2.92. Pedipalp: trochanter 0.358/0.160, femur 0.944/0.179, patella 0.658/0.186, chela (with pedicel) 1.563/0.342, chela (without pedicel) 1.504, hand (without pedicel) length 0.550, movable finger length 0.928. Carapace 0.726/0.517.

Remarks.—*Albiorix meraculus* is known only from two specimens collected in the southern Mexican state of Jalisco (Fig. 3B). It is one of the largest species of the genus, and comparable in size to *A. anophthalmus*, *A. chilensis*, *A. magnus* and *A. oaxaca*. It is easily distinguished from these species by the unusual morphology of the teeth of the fixed chelal finger, which are strongly incised basally (Fig. 14D).

Etymology.—The specific epithet refers to the type locality, Purificación; *meraculus*, a Latin diminutive meaning pure, unadulterated, genuine (Brown 1956).

Albiorix mexicanus (Banks 1898)
Figs. 3B, 6A, 7A, 7C, 7D, 15

Ideoroncus mexicanus Banks 1898:289; Chamberlin 1923:359–360, plate 2 Fig. 13, plate 3 Figs. 14, 34.

Albiorix mexicanus (Banks): Chamberlin 1930:45 Figs. 2f, 2dd; Chamberlin 1931:Figs. 9j, 11u, 17q, 19g, 25l, 59; Beier 1932a:173; Beier 1932b:Fig. 255; Roewer 1936:Fig. 30c; Roewer 1937:257, Fig. 215; Vachon 1949:Fig. 203f; Hoff 1958:14; Mahnert 1984a:673–675, fig 42; Harvey 1991:317; Ceballos 2004:427–428; Harvey & Volschenk 2007:368, Figs. 1–4; Harvey 2013:unpaginated.

Not *Ideoroncus mexicanus* Banks: With 1905:127–131, plate 9 Figs. 2a–d, plate 10 Figs. 1a–f (misidentification; *Bochica withi* (Chamberlin)).

Material examined.—*Neotype.* MEXICO: *Baja California Norte*: female, Bahía de Las Ánimas (labelled ''Las Animas Bay'') (28°50′N, 113°20′W), 8 May 1923, under stone, J.C. Chamberlin (CAS, Entomology Type No. 1267, JC–370.01001; slide).

Other material. MEXICO: *Baja California Norte:* 1 tritonymph, Isla San Esteban (28°42′N, 112°36′W), 20 April 1921, sifted from mesquite leaves, J.C. Chamberlin (CAS, JC–110.01001; 2 slides); *Baja California Sur*: 1 tritonymph, Isla San Marcos (27°13′N, 112°06′W) (CAS, JC–371.01001).

Diagnosis.—*Albiorix mexicanus* differs from other species of the genus by the sharply pointed teeth of the fixed chelal finger (Fig. 15C).

Description.—*Adult:* Color: uniformly pale yellow-brown (neotype; KOH treated).

Setae: generally long, straight and acicular.

Chelicera (Fig. 7A): hand with 5 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 8 (female) small, sub-equal teeth; movable finger with 4 (female) small teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 15A): trochanter and femur entirely granulate, patella lightly granulate on prolateral margin, chelal hand lightly granulate on prolateral and retrolateral faces at base of fingers; trochanter 2.46 (female), femur 4.48 (female), patella 3.04 (female), chela (with pedicel) 3.70 (female), chela (without pedicel) 3.51 (female), hand (without pedicel) 1.34 (female) x longer than broad, movable finger 1.62 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 15A): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t*

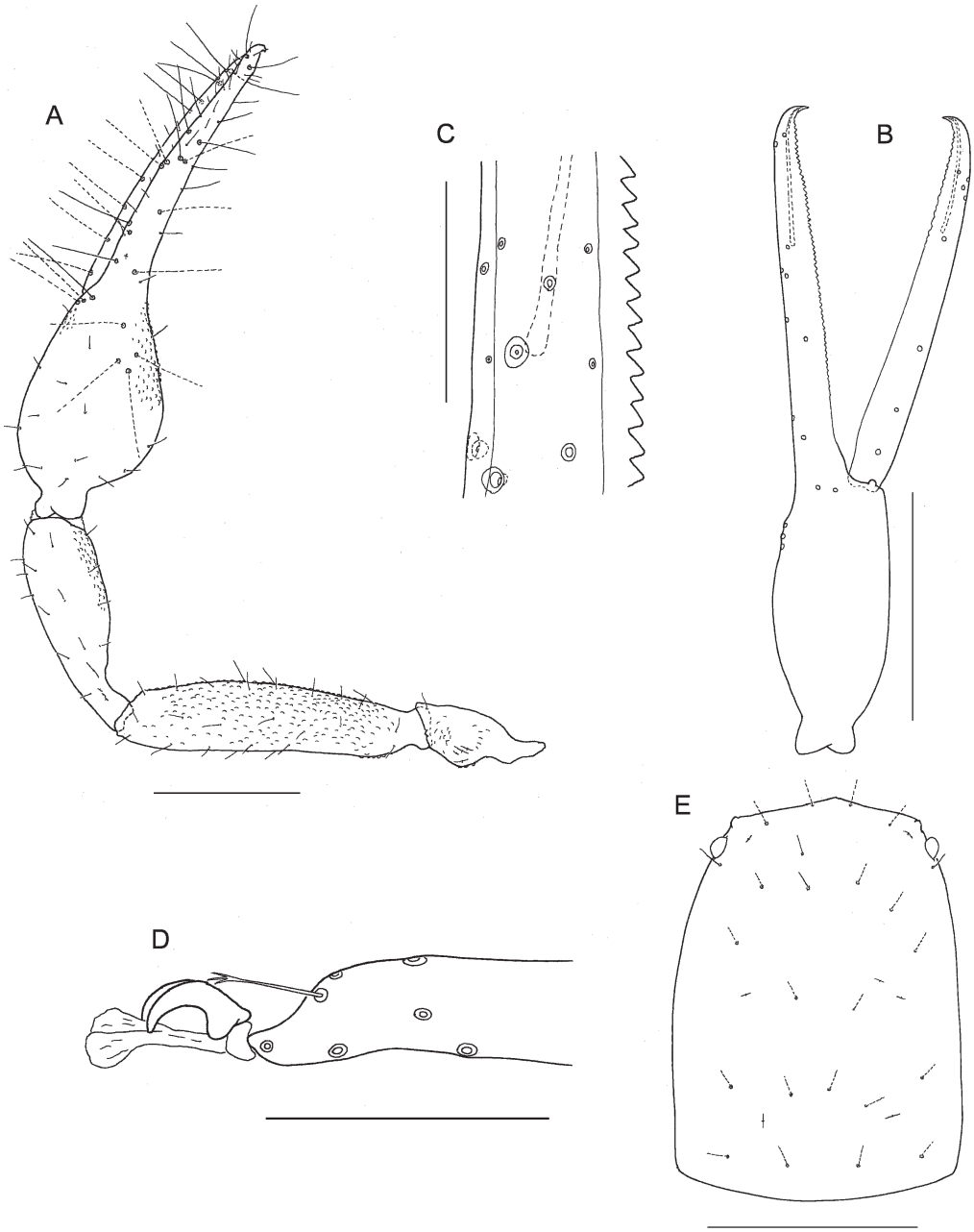

Figure 15.—*Albiorix mexicanus* (Banks): female neotype (CAS) unless stated otherwise: A. Left pedipalp, dorsal; B. Right chela, lateral, tritonymph (CAS, JC–110.01001); C. Detail of fixed chelal finger, tritonymph (CAS, JC–110.01001); D. Tip of right tarsus IV, only subterminal tarsal seta shown; E. Carapace, dorsal. Scale lines = 0.5 mm (A, B, E); 0.1 mm (C, D).

region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus within *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with ca. 69 (female) teeth; movable finger with ca. 30 (female) teeth; shape not discernible due to poor orientation; base of fixed chelal finger with several small denticles.

Carapace (Fig. 15E): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially straight; with 24 setae including 4 setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 7: 5: 5: 6: 5 (female).

Legs: femur + patella 2.62 (female) x longer than deep; subterminal tarsal setae trifurcate (Fig. 15D); arolium longer than claws, deeply divided (Fig. 15D).

Abdomen: tergites not divided, medial sternites without medial suture line; sclerites uniseriate. Tergal chaetotaxy: female, 4: 4: 4: 6: 7: 7: 8: 7: 6: 7 (including 2 tactile setae): 5

(including 2 tactile setae): 2. Sternal chaetotaxy: ♀, 6: (1) 6 (1): (1) 6 (1): 8: 10: 9: 9: 10: 10: 7 (including 3 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: female with large gonosac, which is covered with scattered pores.

Dimensions (mm): Female: neotype: Body length ca. 2.53. Pedipalp: trochanter 0.394/0.160, femur 0.896/0.200, patella 0.656/0.216, chela (with pedicel) 1.504/0.407, chela (without pedicel) 1.428, hand (without pedicel) length 0.547, movable finger length 0.884. Chelicera 0.337/0.152. Carapace 0.819/0.598; eye diameter 0.051. Leg I: femur 0.411/0.095, patella 0.191/0.188, tibia 0.312/0.064, metatarsus 0.173/0.051, tarsus 0.250/0.038. Leg IV: femur + patella 0.674/0.257, tibia 0.460/0.099, metatarsus 0.238/0.070, tarsus 0.347/0.051.

Tritonymph: Chelicera: galea long, slightly curved; hand with 6 setae, movable finger with 1 seta; fixed finger with 6 small teeth, movable finger with 4 small teeth; rallum composed of 4 blades, all serrate.

Carapace: anterior margin medially prominent; 1 pair of rounded eyes present; with 21 setae including 4 setae on anterior margin and 4 setae on posterior margin.

Pedipalp: trochanter 2.35, femur 4.63, patella 3.46, chela (with pedicel) 4.03, chela (without pedicel) 3.88, hand (without pedicel) 1.44 × longer than broad; movable finger 1.65 × longer than hand (without pedicel). Fixed finger with 14 trichobothria, movable finger with 8 trichobothria (Fig. 15B); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria. Chelal hand with retrolateral condyle small and rounded.

Legs: much as in adult.

Dimensions (mm): Body length ca. 2.86. Pedipalp: trochanter 0.369/0.157, femur 0.862/0.186, patella 0.640/0.185, chela (with pedicel) 1.443/0.358, chela (without pedicel) 1.380, hand (without pedicel) length 0.514, movable finger length 0.848. Carapace 0.720/0.550.

Remarks.—The original description of *Ideoroncus mexicanus* by Banks (1898) specifically mentioned only a single specimen collected from San Miguel de Horcasitas, situated in the state of Sonora, Mexico. This specimen was lodged in the California Academy of Sciences but was destroyed in 1906 during the San Francisco earthquake and resulting fire (Chamberlin 1923). A neotype specimen from Baja California was subsequently nominated by Chamberlin (1923). This specimen was collected from Bahía de Las Ánimas in Baja California Sur and is lodged in the California Academy of Sciences. Although Banks (1898) specifically stated that he had examined only a single specimen of *I. mexicanus*, we have found several specimens collected by G. Eisen from San Miguel de Horcasitas, apparently from March to May 1892 (Eisen 1895), which are likely to be conspecific with the destroyed holotype. These specimens are lodged in the Museum of Comparative Zoology and bear the label "*Ideoroncus angustus* Banks" a name that has never been published by Banks or any other author. They consist of three males and three females that have been mounted on microscope slides by W.B. Muchmore, and which clearly represent specimens of *A. conodentatus*. Because they are not labelled with the name *I. mexicanus* and were not mentioned in the original description of *I. mexicanus*, they can be clearly disregarded as part of the type series (International Commission on Zoological Nomenclature 1999). As noted by Mahnert (1984a), these specimens differ from the neotype of *A. mexicanus* in the number of trichobothria on the fixed finger (they have a total of 22, including an extra trichobothrium in each of the *ib* and *ist* groups, compared with the 20 trichobothria found in *A. mexicanus*) and have quite differently shaped chelal teeth. Because these specimens bear no type status, the fact that the original type specimen and the neotype belong to different species has no relevance to this situation (International Commission on Zoological Nomenclature 1999, Article 75) and we here base our concept of *A. mexicanus* on the neotype designated by Chamberlin (1923).

Chamberlin (1923) listed only the female neotype in his redescription of *Ideoroncus mexicanus*, but also referred to two other specimens without providing any collection data. Among the Chamberlin collection lodged in CAS is a specimen from Isla San Esteban (JC–110.01001) which is labelled as a female 'neoparatype' by Chamberlin, and later listed among the material identified as *A. mexicanus* by Chamberlin (1930). This specimen is in fact a tritonymph and likely to be correctly associated with *A. mexicanus* due to the reduced number of trichobothria, 14, on the fixed chelal finger and hand which is characteristic of *Albiorix* tritonymphs with an adult configuration of 20 trichobothria. These locations are only 75 km apart in the Gulf of California. The third specimen is likely to have been from Isla San Marcos, which likewise was claimed to be a female by Chamberlin (1930) but is also a tritonymph and is labelled as a 'neoparatype'. Unlike the tritonymph from Isla San Esteban, the nymph from Isla San Marcos has 15 trichobothria on the fixed chelal finger and hand, suggesting it may represent a different species. Adult specimens from this locality are required to establish its identity. Although W.B. Muchmore was able to examine this second specimen in 1994, the specimen can no longer be found in CAS, and a more detailed examination has not been possible.

The neotype is mounted on a microscope slide, but only left leg I and right leg IV are dissected from the body. The remaining appendages remain attached and although it is possible to count the number of chelal teeth, as they are visible through the cleared fingers, it is not possible to observe their morphology. This is highly regrettable as the shape of the chelal teeth is an extremely important factor in assisting to delimit species of *Albiorix*. As discussed above, the female neotype has a reduced trichobothrial number with only 20 trichobothria on the fixed chelal finger and hand (Fig. 15A). Comparisons with other ideoroncid species suggest that a tritonymph of a species with this pattern would be expected to have 14 trichobothria (Harvey et al. 2007; Mahnert 1984a). This feature is indeed found in the tritonymph collected from Isla San Esteban which is situated only 75 km from the type locality. The teeth of the fixed chelal finger of this tritonymph are clearly quite sharply pointed (Fig. 15C), in contrast to the slightly rounded tips of the teeth in *A. parvidentatus*. It is not

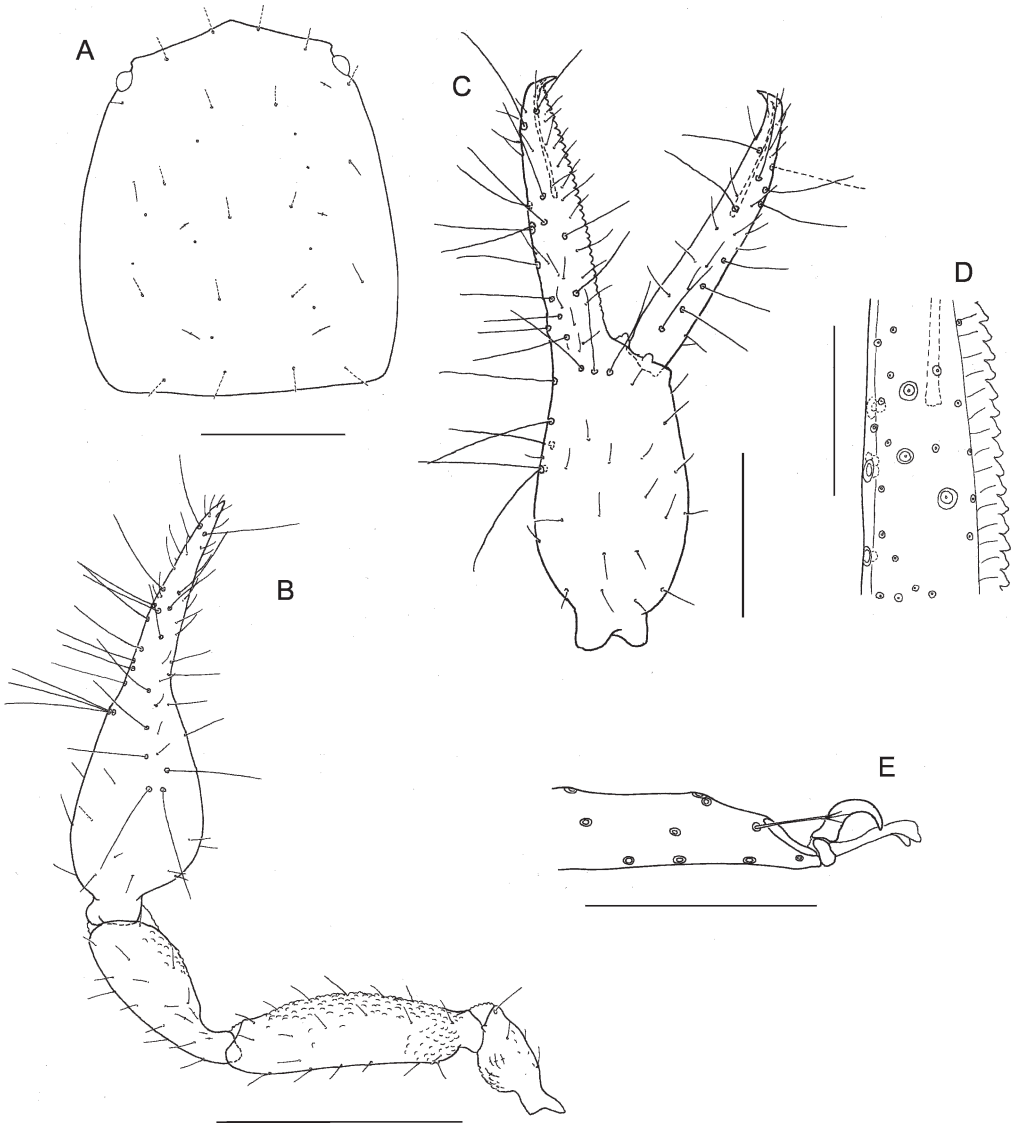

Figure 16.—*Albiorix minor* Harvey & Muchmore sp. nov., male holotype (FSCA, WM1244.01004): A. Carapace; B. Left pedipalp, dorsal; C. Right chela, lateral; D. Detail of fixed chelal finger; E. Tip of left tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (B); 0.2 mm (A); 0.25 mm (C); 0.1 mm (D–F).

known for certain whether the neotype also has sharply pointed teeth, but we prefer to assume that this is the case until it can be proven otherwise by the study of new specimens from the type locality.

The other specimens identified as *A. mexicanus* by Chamberlin (1930) belong to other species: a female from El Centro, California (JC–375.02001), belongs to *A. parvidentatus*; the female from Saint George, Utah (JC–245.01001) is assigned to *A. vigintus*; a male from a series of 8 adults from Straight Wash, Utah (JC–449.01001-8) was examined (the other seven specimens were not located for this study) and identified as *A. gertschi*. The other specimens listed by Chamberlin (1930), a male from Straight Canyon, San Rafael Desert, Utah (JC–450.01001) and a female from Bluff, Utah (JC–437.01001) were not located for this study.

Albiorix mexicanus has been recorded from only a small area of Baja California, Mexico (Fig. 3B).

Albiorix minor Harvey & Muchmore, sp. nov.
Figs. 3B, 16

Material examined.—*Holotype*. MEXICO: *Querétaro*: male, 1 mile SW. of Río Blanco, (21°12′N, 99°45′W), 8 July 1967, under rock in field (FSCA, WM1244.01004).

Paratypes. MEXICO: *Querétaro*: 5 males, 1 female, collected with holotype (FSCA, WM1244.01001–3, 5, 6); 1 male, collected with holotype (WAM T129658, WM1244.01007); *Hidalgo*: 1 female, 10–20 miles S. of Jacala, (20°47′N, 99°11′W), 20 July 1956, V. Roth and W. Gertsch (AMNH, Hoff slide S–3365); *Nuevo León*: 1 female, Sierra de Enmedio, Hogales Ranch, 26°20′N, 100°40′W, Sept. 1951 (AMNH, Hoff slide S-1971); *San Luis Potosí*: 1 male, km 199, Highway 70, (21°52′N, 99°49′W), 22 February 1973, W. Graham (FSCA, WM3391.01001); *Tamaulipas*: 1 female, Gomez Farias, (23°03′N, 99°09′W), 1 June 1964, Reddell, McKenzie, Mahire (FSCA, WM1834.01001).

Diagnosis.—This small species [e.g. chela (with pedicel) 0.814–0.880 (male), 0.922–1.139 (female) mm in length] has strongly retrorse teeth on the fixed chelal finger, which are only slightly longer than high.

Description.—*Adult:* Color: pedipalps, carapace and coxal region red-brown; abdomen pale red-brown; chelicerae and legs light yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 5 or 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 4 (male, female) small teeth; movable finger with 4 (male, female) teeth; rallum of 4 blades, distal pair with several serrations, basal pair smooth; lamina exterior absent.

Pedipalp (Fig. 16B): trochanter with scattered granulations on most faces, femur granulate on prolateral and basal region of retrolateral margins, patella granulate on prolateral margin, chelal hand very sparsely granulate on prolateral margin at base of fingers; trochanter 2.27 (male), 2.31 (female), femur 3.20–3.88 (male), 3.50–4.22 (female), patella 2.59–2.75 (male), 2.68–3.14 (female), chela (with pedicel) 3.34–3.64 (male), 3.29–3.60 (female), chela (without pedicel) 3.14–3.43 (male), 3.09–3.43 (female), hand (without pedicel) 1.27–1.53 (male), 1.37–1.58 (female) x longer than broad, movable finger 1.22–1.41 (male), 1.17–1.34 (female) x longer than hand (without pedicel). Fixed chelal finger usually with 22 trichobothria (one female with 20 and 21 trichobothria, one male with 21 trichobothria on both chelae), movable chelal finger with 10 trichobothria (Fig. 16C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 29–36 (male), 30–39 (female) distinct, strongly retrorse teeth; movable finger with ca. 2–3 (male), 3–8 (female) low teeth, plus many additional smaller swellings; base of fixed chelal finger with several small denticles.

Carapace (Fig. 16A): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 18–23 (male), 19–24 (female) setae including 4 setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 6: 4: 6: 5: 6 (male); 2 + 5: 4: 5: 4: 4 (female).

Legs: femur + patella 2.23 (male), 2.47 (female) x longer than deep; subterminal tarsal setae trifurcate (Fig. 16E); arolium longer than claws, deeply divided (Fig. 16E).

Abdomen: tergites not divided, medial sternites without medial suture line; sclerites uniseriate. Tergal chaetotaxy: holotype male, 4: 4: 6: 8: 8: 8: 8: 8: 8: 7 (including 4 tactile setae): 8 (including 4 tactile setae): 2; female, 4: 4: 4: 7: 8: 8: 8: 8: 8: 5 (including 3 tactile setae): 6 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 6: (1) 12 [4 + 3] (1): (1) 6 (1): 8: 8: 9: 8: 9: 10: 8 (including 4 tactile setae): 2; female, 7: (1) 6 (1): (1) 6 (1): 8: 7: 8: 8: 9: 10: 8 (including 4 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac bipartite; female with large gonosac which is covered with scattered pores.

Dimensions (mm): Males: holotype followed by other males (where applicable): Body length 1.85. Pedipalp: trochanter 0.256/0.113, femur 0.515/0.148 (0.474–0.520/0.134–0.148), patella 0.389/0.148 (0.365–0.396/0.139–0.147), chela (with pedicel) 0.884/0.265 (0.814–0.880/0.230–0.258), chela (without pedicel) 0.832 (0.758–0.832), hand (without pedicel) length 0.371 (0.320–0.360), movable finger length 0.477 (0.422–0.462). Chelicera 0.238/? (poorly oriented). Carapace 0.515/0.443; eye diameter 0.030. Leg I: femur 0.256/0.075, patella 0.134/0.077, tibia 0.187/0.056, metatarsus 0.107/0.045, tarsus 0.187/0.035. Leg IV: femur + patella 0.432/0.194, tibia 0.301/0.090, metatarsus 0.164/0.064, tarsus 0.237/0.042.

Females: paratype (WM1244.01001) followed by other females (where applicable): Body length 2.22. Pedipalp: trochanter 0.282/0.122, femur 0.556/159 (0.525–0.688/0.148–0.163), patella 0.429/0.160 (0.390–0.506/0.141–0.161), chela (with pedicel) 0.988/0.300 (0.922–1.139/0.269–0.316), chela (without pedicel) 0.928 (0.856–1.083), hand (without pedicel) length 0.426 (0.394–0.498), movable finger length 0.499 (0.461–0.596). Chelicera 0.281/? (poorly oriented). Carapace 0.563/? (poorly oriented); eye diameter 0.036. Leg I: femur 0.279/0.086, patella 0.147/0.082, tibia 0.220/0.061, metatarsus 0.128/0.048, tarsus 0.198/0.038. Leg IV: femur + patella 0.484/0.196, tibia 0.333/0.090, metatarsus 0.183/0.064, tarsus 0.246/0.045.

Trichobothrial variation.—The female from Tamaulipas (FSCA, WM1834.01001) has a total of 20 trichobothria on the left chela and 21 on the right, and one of the males from 1 mile SW. of Rio Blanco (FSCA, WM1244.01006) has 21 trichobothria on each chela. In each case, the missing trichobothria are absent from the *ist* region.

Remarks.—*Albiorix minor* occurs throughout the Sierra Madre Oriental of eastern Mexico (Fig. 3B).

Etymology.—This species is named for its small size (*minor*, Latin, less).

Albiorix mirabilis Muchmore 1982
Figs. 3C, 17

Albiorix mirabilis Muchmore 1982b: 75–77, figs 33–36; Mahnert 1984a:676, Fig. 46; Harvey 1991:317; Ceballos 2004:428; Harvey et al. 2007:Fig. 5; Harvey 2013:unpaginated.

Material examined.—*Holotype*. **Mexico:** *Oaxaca*: Male, la Cueva de las Maravillas, 6 km S. of Acatlán (de Perez Figueroa) (18°29′N, 96°36′W), 29 December 1976, J.R. Reddell, A. Grubbs, C. Soileau, D. McKenzie (FSCA, WM4675.03001).

Diagnosis.—*Albiorix mirabilis* differs from all other species of the genus by the shape of the teeth on the fixed chelal finger, which are pointed and widely spaced.

Description.—*Adult:* Color: Pale yellow-brown, pedipalps and carapace red-brown.

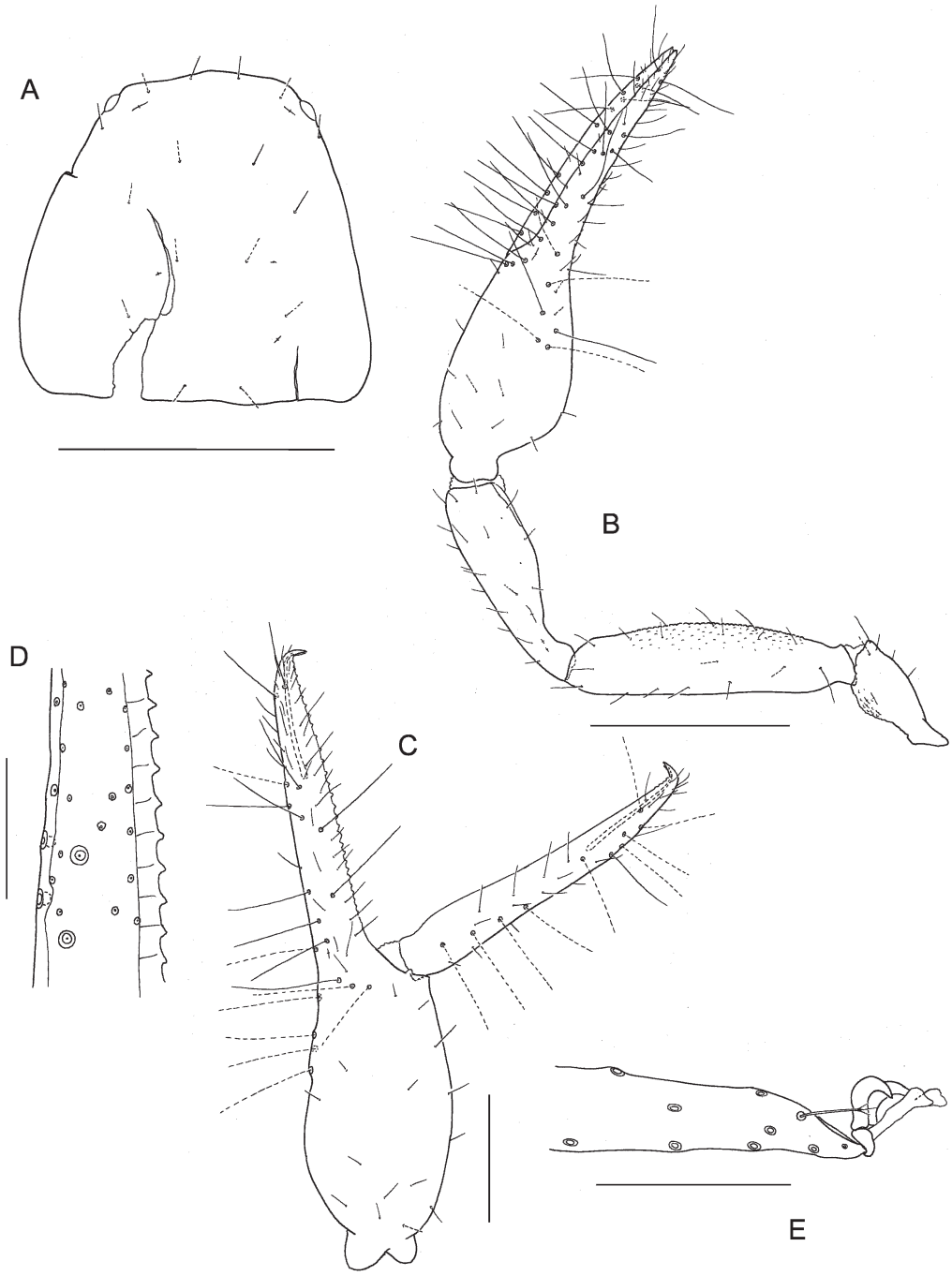

Figure 17.—*Albiorix mirabilis* Harvey & Muchmore sp. nov., male holotype: A. Carapace (flattened during slide preparation); B. Left pedipalp, dorsal; C. Right chela, lateral; D. Detail of fixed chelal finger; E. Tip of left tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (A, B); 0.25 mm (C); 0.1 mm (D, E).

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 5 small teeth; movable finger with 4 teeth; rallum of 4 blades, each with several serrations on anterior margin; lamina exterior absent.

Pedipalp (Fig. 17B): trochanter with scattered granulations, femur and patella lightly granulate on prolateral margin, chelal hand smooth; trochanter 2.32 (male), 4.17 (male), patella 3.39 (male), chela (with pedicel) 3.90 (male), chela (without pedicel) 3.73 (male), hand (without pedicel) 1.59 (male) x longer than broad, movable finger 1.35 (male) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 17C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly

distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and basal portion of *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with ca. 32 small pointed teeth; movable finger with 4 very low teeth at distal end, the remainder absent; base of fixed chelal finger with several small denticles.

Carapace (Fig. 17A): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 16 setae including 4 setae on anterior margin and 2 on posterior margin; with 1 posterior furrow.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 6: 5: 5: 4–5: 6 (♂).

Legs: femur + patella 2.54 (male) x longer than deep; subterminal tarsal setae with trifurcate, each tine quite long (Fig. 17E); arolium longer than claws, deeply divided (Fig. 17E).

Abdomen: tergites not divided, medial sternites without medial suture line; sclerites uniseriate. Tergal chaetotaxy: male, 4: 4: 6: 6: 8: 8: 8: 8: 8: 8 (including 4 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 11: (1) 8 [3 + 3] (1): (1) 6 (1): 9: 9: 9: 10: 10: 10: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with medium-sized dorsal apodeme; median genital sac apparently bifurcate.

Dimensions (mm): Male holotype: Body length 2.10. Pedipalp: trochanter 0.327/0.141, femur 0.722/0.173, patella 0.566/0.167, chela (with pedicel) 1.216/.312, chela (without pedicel) 1.163, hand (without pedicel) length 0.496, movable finger length 0.670. Chelicera 0.290/0.131. Carapace 0.660/0.646 (flattened); eye diameter 0.045. Leg I: femur 0.353/0.093, patella 0.175/0.093, tibia 0.256/0.064, metatarsus 0.165/0.052, tarsus 0.250/0.038. Leg IV: femur + patella 0.571/0.225, tibia 0.410/0.101, metatarsus 0.221/0.070, tarsus 0.307/0.045.

Remarks.—*Albiorix mirabilis* has only been found in Cueva de las Maravillas, which is situated near the town of Acatlán de Perez Figueroa, in southern Mexico (Fig. 3C). The original description by Muchmore (1982b) is quite detailed, but we here provide a new description and new figures of the only known specimen, the male holotype.

Albiorix oaxaca Harvey & Muchmore, sp. nov.
Figs. 3C, 18

Material examined.—*Holotype*. MEXICO: *Oaxaca*: male, Huatla de Jiménez (18°08′N, 96°51′W), 9 November 1968, Reyes and Cabrera (FSCA, WM7260.01001).

Diagnosis.—This is one of the largest species of the genus, and is approached in size only by *A. anophthalmus*, *A. chilensis*, *A. magnus* and *A. meraculus*. It is easily distinguished by the morphology of the subterminal tarsal seta which has 1 very long distal tine and 2 short basal tines (Fig. 18E).

Description.—*Adult:* Color: pedipalps, carapace and coxal region deep red-brown; abdomen red-brown; chelicerae and legs light yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate, slightly curved; fixed finger with 6 teeth as well as 2 small teeth; movable finger with 7 teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 18B): trochanter lightly granulate on retrolateral face, femur lightly granulate over most surfaces but with stronger granulations on prolateral face, patella lightly granulate over prolateral face, chela with light granulations on prolateral face but otherwise fairly smooth; trochanter 2.29 (male), femur 4.12 (male), patella 3.21 (male), chela (with pedicel) 3.69 (male), chela (without pedicel) 3.47 (male), hand (without pedicel) 1.57 (male) x longer than broad, movable finger 1.29 (male) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Figs. 3C, 18C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus at anterior end of *est* region in fixed finger and basal to the *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 70 retrorse, close-set teeth (Fig. 18D); movable finger with several distal teeth none of which are upraised, leading into many very low teeth which extend along entire length of finger; base of fixed chelal finger with several small denticles.

Carapace (Fig. 18A): lateral margins evenly convex; 0.96 (male) x longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with 23 setae including 4 setae on anterior margin and 4 on posterior margin; without furrows.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 7: 5: 6: 6: 7.

Legs: femur + patella 2.88 (male) x longer than deep; metatarsus and tarsus III and IV with sub-basal tactile seta; subterminal tarsal setae with 1 very long distal tine and 2 short basal tines (Fig. 18E); arolium longer than claws, deeply divided.

Abdomen: tergites and sternites not divided; sclerites uniseriate, except for sternite II, which has 2 irregular rows and sternite III, which has 1 seta placed slightly in advance of others. Tergal chaetotaxy: male: 4: 5: 8: 9: 8: 9: 10: 9: 9: 9 (including 2 lateral tactile setae): 8 (including 4 tactile setae): 2. Sternal chaetotaxy: male: 10: (1) 15 [3 + 3] (1): (1) 7 (1): 14: 10: 11: 11: 10: 11: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with small dorsal apodeme; median genital sac not preserved in specimen.

Dimensions (mm): Male: holotype: Body length 2.96. Pedipalp: trochanter 0.48/0.21, femur 1.03/0.25, patella 0.835/0.26, chela (with pedicel) 1.81/0.49, chela (without pedicel) 1.70, hand (without pedicel) length 0.77, movable finger length 0.99. Chelicera 0.445/0.21, movable finger length 0.275. Carapace 0.85/0.89 (but distorted on slide); eye diameter 0.045. Leg I: femur 0.494/0.134, patella 0.268/0.125, tibia 0.396/0.091, metatarsus 0.205/0.072, tarsus 0.314/0.058.

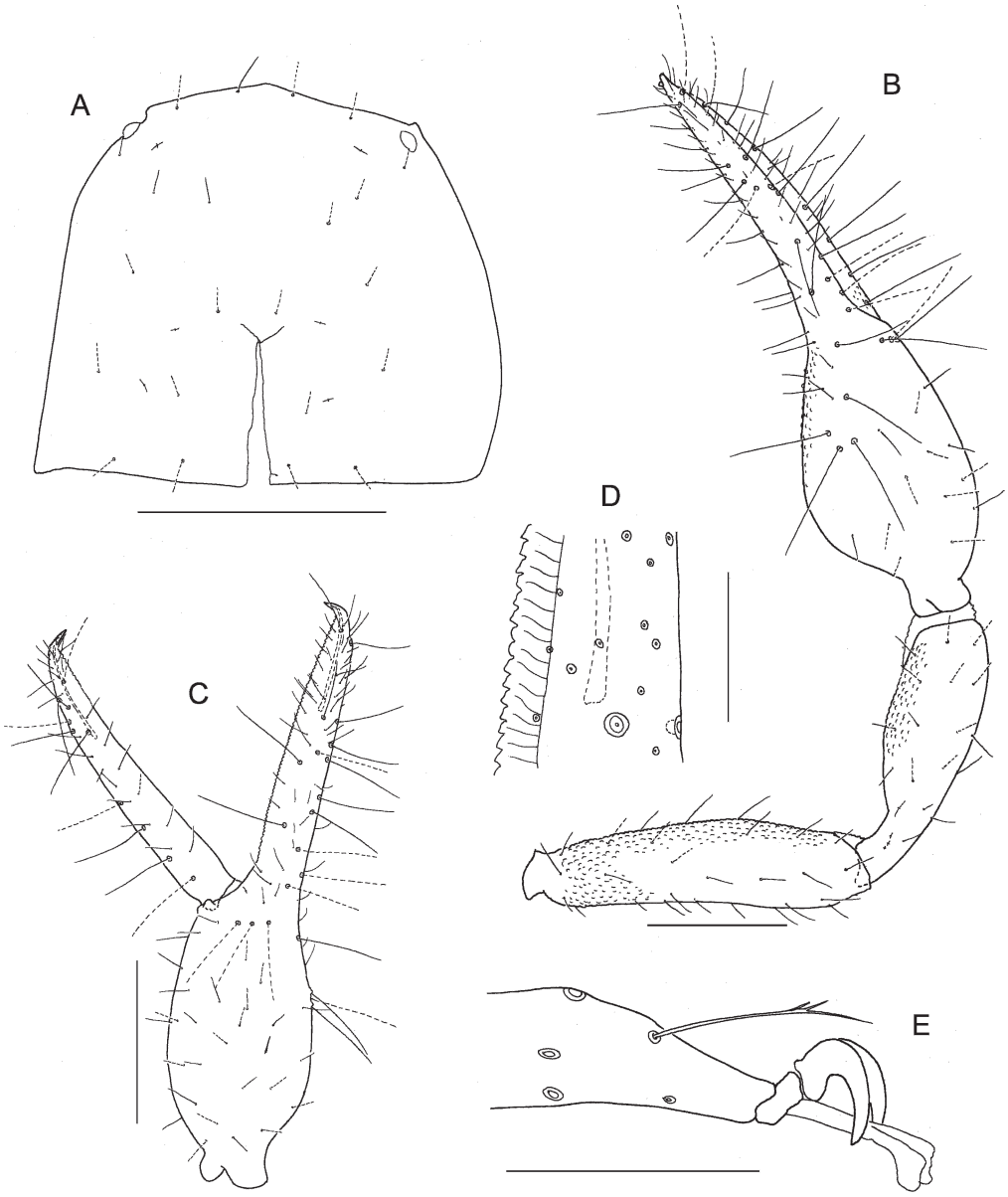

Figure 18.—*Albiorix oaxaca* Harvey & Muchmore sp. nov., male holotype: A. Carapace (flattened during slide preparation); B. Right pedipalp, dorsal (without trochanter); C. Left chela, lateral; D. Detail of fixed chelal finger; E. Tip of left tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (A, B); 0.2 mm (C); 0.1 mm (D, E).

Leg IV: femur + patella 0.865/0.30, tibia 0.58/0.14, metatarsus 0.30/0.105, tarsus 0.45/0.065.

Remarks.—*Albiorix oaxaca* has only been found in the state of Oaxaca in southern Mexico (Fig. 3C).

Etymology.—The specific epithet is a noun in apposition taken from the type locality.

Albiorix parvidentatus Chamberlin 1930
Figs. 1A, 1B, 3A, 6B–F, 7E–H, 19

Albiorix parvidentatus Chamberlin 1930:45–46; Beier 1932a:173; Roewer 1936:Fig. 30b; Roewer 1937:257; Hoff 1958:15; Harvey 1991:318; Harvey 2013:unpaginated.

Material examined.—*Holotype*. USA: *California:* male, Palm Canyon, Riverside County (33°48′N, 116°31′W), 5 April 1925, under stone, J.C. Chamberlin (CAS, Entomology Type No. 17458, JC–535.02001).

Other material. MEXICO: *Baja California*: 1 female, El Mayor (32°08′N, 115°16′W), 4 April 1939, no collector (UCDC). USA: *Arizona*: 1 female, Cochise County, 3 miles E. of Portal (31°55′N, 109°04′W), 11 September 1950, W.J. Gertsch (AMNH, Hoff slide S–1586.1); 1 female, Cochise County, Cave Creek Canyon, South-West Research Station (31°52′N, 109°13′W), 22 August 1956, A.F. Archer (AMNH, Hoff slide S–3518); 2 females, Cochise County, Chiricahua Mountains (31°56′N, 109°23′W), 5,400 feet, 14 April 1961, P. Wygodzinsky (UCDC); 15 males, 12 females, Cochise County, Chiricahua Mountains, 3 miles N. of Portal (31°57′N, 109°08′W), 23 March 1984, under rocks, W. and E. MacKay (FSCA, WM6559); 1 male, Cochise County, Huachuca

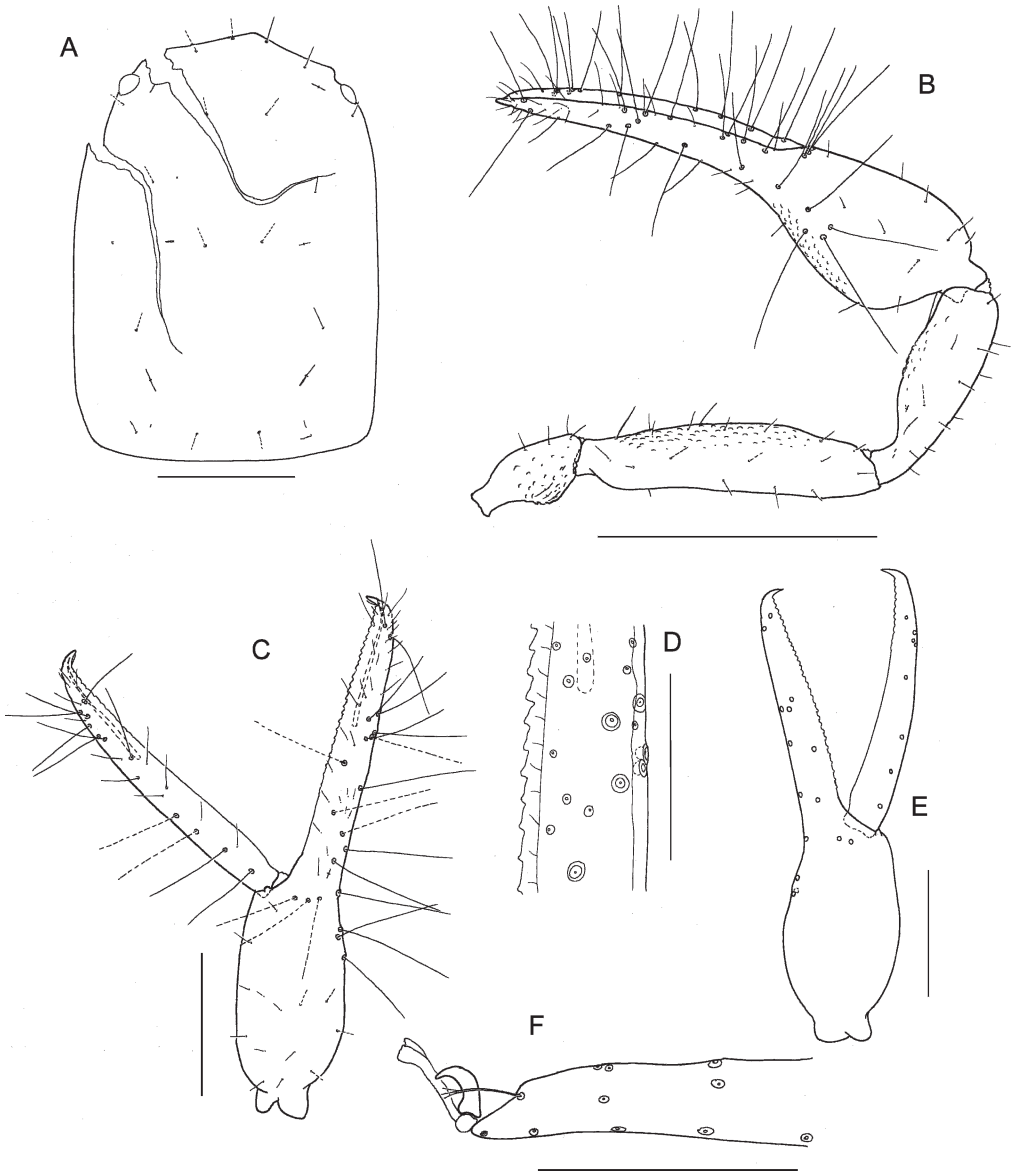

Figure 19.—*Albiorix parvidentatus* Chamberlin, male holotype, unless stated otherwise: A. Carapace, dorsal; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Right chela, lateral, tritonymph (CAS, JC–547.01003); F. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (B, C, E); 0.2 mm (A); 0.1 mm (D, F).

Mountains (31°24′N, 110°18′W), 2009, J. Cowles (WAM T108162); 2 males, Cochise County, Upper Carr Canyon, Huachuca Mountains (31°26′N, 110°18′W), 22 July 1955, W.J. Gertsch (AMNH, Hoff slide S–3406.1–2); 1 female, Gila County, 2 miles S. of Payson (34°13′N, 111°19′W), 11 April 1935, W. Ivie (CAS, JC–1360.01001); 2 males, 2 females, Gila County, 8 miles N. of [Theodore] Roosevelt Dam (33°40′N, 111°10′W), 11 April 1935, W. Ivie (CAS, JC–1371.01001–4); 2 females, Graham County, Marijilda (as Naritilda) Canyon, Graham Mountains (32°42′N, 109°47′W), 5,100 feet, 7 April 1961, P. Wygodzinsky (UCDC); 2 females, Graham County, Noon Creek, Graham Mountains (32°40′N, 109°47′W), 7 April 1961, P. Wygodzinsky (UCDC); 1 male, Maricopa County, junction of Mesa and Salt Rivers (33°27′N, 111°51′W), 9 April 1935, W. Ivie (CAS, JC–1372.04001); 1 female, Maricopa County, Seven Springs (33°58′N, 111°51′W), August 1966 (MCZ, WM1628.01001); 1 female, Pima County, Arkenstone Cave, Colossal Cave Mountain Park, at gate (entrance) to cave (32°04′N, 110°38′W), 29 July 1990, R.B. Pape (FSCA, WM7539.01001); 1 ♂, 3 ♀, Pima County, Arkenstone Cave, Colossal Cave Mountain Park, at gate (entrance) to cave (32°04′N, 110°38′W), 21 March 1998, R.B. Pape (FSCA, WM8234); 1 male, Pima County, Baboquivari Mountains, Brown Canyon (31°45′N, 111°31′W), 19 July 1959, V. Roth (AMNH, WM1736.02001); 1 male, Pima County, Baboquivari Canyon, west side, Baboquivari Mountains (31°47′N, 111°37′W), 25–27 August 1952, H.B. Leech, J.W. Green (UCDC); 2 males, Pima County, Elkhorn Ranch, E. slope of N. end Baboquivari Mountains (31°49′N, 111°32′W), 28 July 1952, H.B. Leech, J.W. Green (UCDC); 1 female, Pima County, Gates Pass, near Tucson (32°13′N, 111°06′W), 28 March 2009, J. Cowles (WAM T108158); 1 male, 1 female, Pima County, Sabino

Basin, Santa Catalinas (32°20′N, 110°48′W), 8–12 July 1916 (AMNH, Hoff slide S–185.1–2); 1 male, Pima County, Santa Catalina Mountains (32°25′N, 110°42′W), 25 May 1936, Bryant (AMNH, Hoff slide S–194.1); 1 female, Pima County, Tucson (32°13′N, 110°56′W), 1 April 1936, Bryant (AMNH, Hoff slide S–189); 1 female, Pima County, Tucson Mountains (32°13′N, 111°07′W), 15 February 1957, V. Roth (AMNH, Hoff slide S–3520); 12 males, 11 females, 1 tritonymph, Pima County, Tucson, 12740 East Chukut Trail (32°17′23″N, 110°43′13″W), 21 January 2013, under rock on hillside, M.S. Harvey, F. Harvey (WAM T129246, T129656); 1 male, Pima County, Vail (32°00′N, 110°42′W), 2 July 2009, J. Cowles (WAM T108161); 1 male, 1 female, Pinal County, Oracle (32°37′N, 110°46′W), 7 March 1980, decaying sotol clump (*Dasylirion wheeleri*), D.W. Zeh (FSCA, WM5979.01001–2); 1 female, Santa Cruz County, 5 miles NE. of Patagonia (31°35′N, 110°42′W), 14 September 1991, R.B. Pape (FSCA, WM8093); 1 tritonymph, Yuma County, Fortuna Mine (32°33′N, 114°20′W), 27 January 1957, V. Roth (AMNH, Hoff slide S–4102); 1 male, 1 female, Yuma County, Fortuna Mine (32°33′N, 114°20′W), 7 February 1960, V. Roth (AMNH, Hoff slide S–4103.1–2); 1 male, 1 female, Yuma County, 2 miles W. of Ligurta (32°40′N, 114°18′W), 15 January 1983, G. Lowe (WAM T127031); 2 males, 1 female, Yuma County, Palm Canyon (33°22′N, 114°06′W), 18 November 1961, D. Tuttle (UCDC); 1 male, Yuma County, Palm Canyon (33°22′N, 114°06′W), 10 May 1958, V. Roth (AMNH, Hoff slide S–4089); 1 male, Yuma County, Palm Canyon, Kofa Mountains (33°22′N, 114°06′W), 10 March 1960, V. Roth (AMNH, Hoff slide S–4094); 2 males, 1 female, Yuma County, canyon north of Palm Canyon (33°22′N, 114°06′W), 6 March 1960, V. Roth (AMNH, Hoff slide S–4096.1–3); *California*: 1 female, Imperial County, El Centro (32°48′N, 115°34′), 8 December 1927, F.R. Blaisdell (CAS, JC–375.02001); 1 female, Imperial County, Julian Wash, Black Mountain Road (33°05′N, 114°42′W), 15 January 1983, G. Lowe (WAM T127034); 2 females, Inyo County, Beveridge Canyon, Inyo Mountains (36°43′N, 117°51′W), 6,500 feet, 4 June 1975, D. Giuliani (FSCA, WM4905.02001–2); 1 male, 1 female, Inyo County, White Mountains, 6.4 miles NE. of Big Pine (37°14′N, 118°13′W), 25 April –22 July 1982, ethylene glycol can trap, D. Giuliani (FSCA, WM7704); 2 males, 1 female, Los Angeles County, Mt Baldy Rd, below Mt Baldy village (34°14′N, 117°40′W), 15 April 1987, under rock, G. Lowe (WAM T127033); 1 female, Los Angeles County, San Clemente Island (32°54′N, 118°30′W), 10 April 1923, Crosby (CAS, JC–734.02001); 1 male, Los Angeles County, Switzers Camp, Angeles Forest Highway (34°15′31″N, 118°09′18″W), 27 June 1985, G. Lowe (WAM T127036); 1 tritonymph, Orange County, Laguna Beach [33°32′N, 117°46′W], 28 December 1932, W. Ivie (CAS, JC–1748.02001); 1 male, 1 female, Orange County, Laguna Beach (33°32′N, 117°46′W), 22 July 1931, W. Ivie (CAS, JC–1628.01001–2); 1 male, Orange County, Santa Ana, Irvine Park (33°45′N, 117°56′W), 17 July 1931, W. Ivie (CAS, JC–1824.01001); 3 males, Riverside County, 2 miles SE. of Cabazon, base of mountains (33°53′N, 116°46′W), 9 April 1982, G. Lowe (WAM T127035); 1 male, Riverside County, Coyote Canyon (33°40′N, 116°22′W), 12 December 1963, ex fern, W.H. Ewart (UCRC, WM4278; Univ. California Insect Survey Specimen # 306795); 1 female, Riverside County, Deep Canyon, 1/2 mile S. of Pinyon Crest (turn off), Santa Rosa Mountains (33°41′N, 116°22′W), 3,600 feet, 5 April 1974, under rock, W. Icenogle (UCRC, WM5380); 5 males, 2 females, Riverside County, Deep Canyon, 1/2 mile S. of Pinyon Crest (turn off), Santa Rosa Mountains (33°41′N, 116°22′W), 3,600 feet, 16 April 1974, under rocks in ravine, W. Icenogle (UCRC, WM5381); 1 male, Riverside County, Lake Herender [not traced], 14 April 1956, from desert plants, I.M. Newell (AMNH, Hoff slide S–3533); 18 males, 6 females, 1 tritonymph, Riverside County, Lamb Canyon, 2 miles NW. of Gilman Hot Springs (33°51′N, 117°01′W), 1,520 feet, 4 March 1979–23 December 1980, coastal sage scrub, hillside, ethylene glycol can trap, R.L. Aalbu (FSCA, WM6300); 2 tritonymph exuviae, Riverside County, near Riverside (33°57′N, 117°24′W), 26 November 1925, under stone on a desert hillside, J.C. Chamberlin (CAS, JC–547.01003); 1 male, Riverside County, Santa Rosa Mountains, Deep Canyon (33°41′N, 116°22′W), 27 April 1979, W. Icenogle (UCRC, WM6050.01001); 1 female, Riverside County, Snow Creek (33°53′29″N, 116°41′27″W), 29 June 2002, under rock, M.S. Harvey (WAM T127032); 2 males, San Diego County, Anza Borrego State Park,Box Canyon (33°15′N, 116°24′W), 14 April 1981, D. Ubick (CAS); 1 male, San Diego County, Anza-Borrego Desert State Park (33°14′N, 116°16′W), 26 March 1991, D. Ubick (CAS); 1 male, San Diego County, Sheep Canyon, Borrego State Park (33°20′N, 116°29′W), 27 April 1955, R.O. Schuster (UCDC, Hoff slide S–3360.1); 1 male, Tulare County, Lindsay (36°12′N, 119°05′W), 13 March 1963, W.H. Ewart (UCRC, WM4276); *New Mexico*: 2 males, Catron County, Deep Creek, 13 miles NE. of Glenwood (33°27′N, 108°46′W), 30 July 1979, A. Grubbs (FSCA, WM5855.01001–2).

Diagnosis.—The combined presence of eyes (Fig. 19A), prolateral face of the chelal hand granulate (Fig. 19B), trifurcate subterminal tarsal setae with short tines of equal length (Fig. 19F), median teeth of the fixed chelal finger noticeably longer than high and with a noticeably sinuate distal face (Fig. 19D), 22 trichobothria on the fixed chelal finger and hand (Figs. 5L, 19C), and trichobothrium ib_5 situated on approximately same level as *eb*, *esb* and *isb*, and est_4 situated within the *ist* region (Figs. 19C) distinguishes *A. parvidentatus* from all species of the genus.

Description.—*Adult:* Color: pedipalps, carapace and coxal region red-brown; abdomen pale red-brown; chelicera and legs light yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6, or very rarely 5 or 7 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 2 (male), 6 (female) small teeth; movable finger with 2 (male), 6 (female) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 19B): trochanter with scattered granulations, femur granulate on most faces, but coarsely granulate on prolateral surface, patella lightly granulate on prolateral margin, chelal hand lightly granulate on prolateral surface at base of fingers; trochanter 2.06–2.56 (male), 2.17–2.48 (female), femur 3.69–4.48 (male), 3.62–4.65 (female), patella 2.71–3.42 (male), 2.61–3.34 (female), chela (with pedicel) 3.30–4.31 (male), 3.17–4.14 (female), chela (without pedicel) 3.09–4.06 (male), 2.96–3.93 (female), hand (without pedicel) 1.20–1.63 (male), 1.28–1.58 (female) x longer than broad, movable finger 1.28–1.69 (male), 1.24–1.62 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 22

trichobothria, movable chelal finger with 10 trichobothria (Fig. 19C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus within *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 29–53 (male), 31–49 (female) low, retrorse teeth; movable finger with ca. 3–15 (male), 5–12 (female) very low teeth, followed by undulations; base of fixed chelal finger with several small denticles.

Carapace (Fig. 16A): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 18–22 (male), 17–21 (female) setae including 4 setae on anterior margin and 4 (rarely 5) on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 5–7: 4: 5: 5: 4 (holotype male); 2 + 7: 5: 5: 5: 6 (female).

Legs: femur + patella 2.14–2.71 (male), 2.30–2.92 (female) x longer than deep; subterminal tarsal setae trifurcate (Fig. 16E); arolium longer than claws, deeply divided (Fig. 16E).

Abdomen: tergites and sternites not divided; sclerites uniseriate, except for sternite II and III of males, which have scattered setae. Tergal chaetotaxy: holotype male, 2: 4: 4: 6: 7: 6: 6: 6: 6: 6 (including 2 tactile setae): 8 (including 4 tactile setae): 2; female, 4: 4: 5: 8: 8: 8: 8: 7: 6: 7: 7 (including 4 tactile setae): 2. Sternal chaetotaxy: male holotype, 7: (1) 6 [3 + 3] (1): (1) 6 (1): 8: 9: 8: 8: 8: 6: 8 (including 4 tactile setae): 2; female from Snow Creek, 10: (1) 5 (1): (1) 6 (1): 9: 9: 8: 9: 11: 8: 10 (including 4 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac deeply bipartite; female with large gonosac, which is covered with scattered pores.

Dimensions (mm): Males: holotype followed by other males (where applicable): Body length 1.76 (1.70–3.15). Pedipalp: trochanter 0.224/0.109 (0.243–0.385/0.109–0.154), femur 0.550/0.124 (0.513–0.844/0.128–0.205), patella 0.397/0.128 (0.386–0.640/0.132–0.187), chela (with pedicel) 0.941/0.240 (0.872–1.400/0.252–0.396), chela (without pedicel) 0.896 (0.82–1.328), hand (without pedicel) length 0.334 (0.333–0.557), movable finger length 0.557 (0.493–0.824). Chelicera 0.216/0.097, movable finger length 0.122. Carapace 0.544/0.400 (0.479–0.665/0.432–0.550); eye diameter 0.031. Leg I: femur 0.275/0.069, patella 0.139/0.068, tibia 0.202/0.048, metatarsus 0.125/0.041, tarsus 0.195/0.032. Leg IV: femur + patella 0.461/0.204 (0.421–0.659/0.185–0.293), tibia 0.306/0.077, metatarsus 0.164/0.058, tarsus 0.261/0.032.

Females: specimen from Snow Creek, California (WAM T127032) followed by other females (where applicable): Body length 2.64 (2.03–3.05). Pedipalp: trochanter 0.382/0.161 (0.295–0.422/0.123–0.172), femur 0.739/0.191 (0.582–0.957/0.141–0.224), patella 0.600/0.205 (0.432–0.688/0.147–0.247), chela (with pedicel) 1.424/0.383 (1.106–1.514/0.272–0.444), chela (without pedicel) 1.352 (0.958–1.427), hand (without pedicel) length 0.560 (0.400–0.610), movable finger length 0.816 (0.531–0.848). Chelicera 0.319/0.145, movable finger length 0.187. Carapace 0.720/0.510 (0.547–0.780/0.429–0.630); eye diameter 0.045. Leg I: femur 0.390/0.098, patella 0.203/0.090, tibia 0.328/0.062, metatarsus 0.180/0.050, tarsus 0.252/0.037. Leg IV: femur + patella 0.610/0.232 (0.471–0.659/0.179–0.247), tibia 0.450/0.100, metatarsus 0.230/0.072, tarsus 0.335/0.042.

Tritonymph: Chelicera: galea long, slightly curved; hand with 6 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 1.73, femur 2.72, patella 2.72, chela (with pedicel) 4.49, chela (without pedicel) 4.24 × longer than broad. Fixed finger with 15 trichobothria, movable finger with 8 trichobothria (Fig. 19E); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria; *isb* and *sb* absent. Chelal hand with retrolateral condyle small and rounded.

Carapace: anterior margin medially prominent; 1 pair of small eyes present; with 18 setae, including 4 setae on anterior margin and 4 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, subbasal.

Legs: much as in adults.

Dimensions (mm): Body length 1.28. Pedipalp: trochanter 0.242/0.147, femur 0.490/0.133, patella 0.364/0.134, chela (with pedicel) 0.854/0.190, chela (without pedicel) 0.806, hand (without pedicel) length 0.317, movable finger length 0.513. Carapace 0.435/0.390.

Trichobothrial variation.—The four specimens from Los Angeles County, California (WAM T127033, T127036 and CAS JC–734.02001) and one of the males from San Diego County (Anza-Borrego) (CAS) each have only 20 trichobothria on both chelal fingers, which is generally formed by the presence of only 4 trichobothria in the *ib* region and 5 in the *ist* region. In one specimen from Switzer Camp (WAM T127036), there are 4 trichobothria in the *ib* region and only 4 in the *ist* region. The two females from Marijilda Canyon, Arizona (UCDC) appear to have only 21 trichobothria on each chela with a single trichobothrium absent from the *ist* region. The uncertainty is due to the poor quality of the slide preparations. The male from Fortuna Mine, Arizona (AMNH Hoff slide S-4103.1) has only 21 trichobothria on the left chela and 22 trichobothria on the right chela, with the missing trichobothrium from the *ist* region.

Remarks.—Chamberlin (1930) described and named this species from the adult holotype male from Palm Canyon, California. He also had listed a "dead and immature female (JC–547.01003), together with its cast skin." This slide-mounted material actually consists of the exuviae of two tritonymphs, along with a single silken molting chamber, which is included in the slide-mount.

There is considerable size variation within this species but there appear to be no consistent features that may be used to suggest there is more than one species present. For example, the two specimens (the male holotype and a female from Snow Creek) used to provide much of the individual data in the

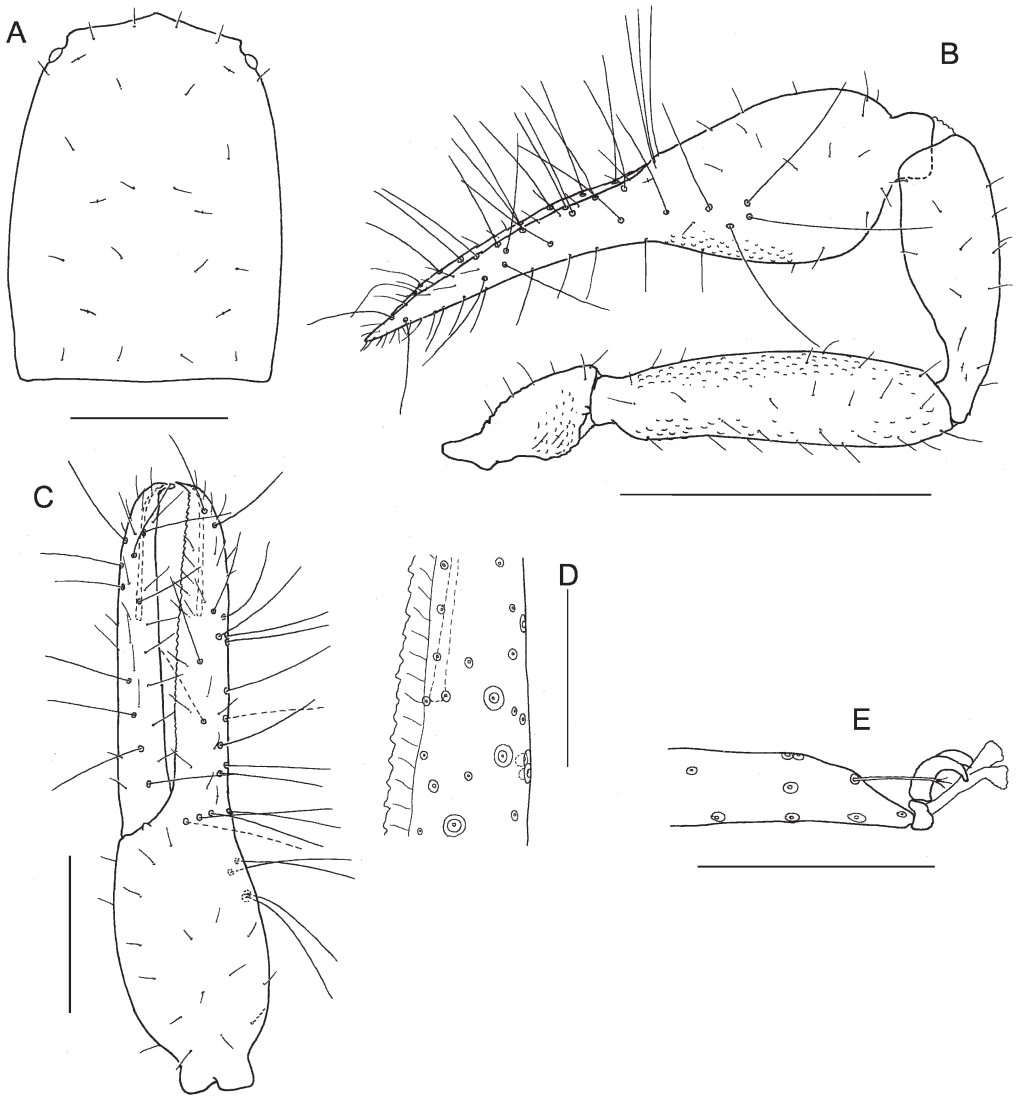

Figure 20.—*Albiorix puebla* Harvey & Muchmore sp. nov., male holotype: A. Carapace, dorsal; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (B); 0.25 mm (A, C); 0.1 mm (D, E).

description were collected only 19 km apart but are considerably different in size, as the male holotype has a chela (with pedicel) length of 0.94 mm and the female from Snow Creek is 1.42 mm.

Albiorix parvidentatus is found throughout southern California, Arizona, south-western New Mexico and north-western Mexico (Fig. 3A). Specimens are most frequently recorded under rocks in dry ecosystems.

Albiorix puebla Harvey & Muchmore, sp. nov.
Figs. 3C, 20

Material examined.—*Holotype*. MEXICO: *Puebla*: male, Tehuacán (18°28′N, 97°24′W), 6 July 1941, H. Dybas (CAS, JC–2190.01001).

Paratype. 1 male, collected with holotype (CAS, JC–2190.01002).

Diagnosis.—*Albiorix puebla* shares with *A. retrodentatus* the strongly sinuate distal face of the teeth of the fixed chelal finger, but is slightly smaller (e.g., chela (with pedicel) length 0.963–0.976 mm versus 1.065–1.448 mm in *A. retrodentatus*), and trichobothrium ist_1 is situated directly dorsal to ist_3, but is slightly dorso-distal to ist_3 in *A. retrodentatus*.

Description.—*Adult:* Color: pedipalps and carapace red-brown, legs and chelicerae light brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 3 (male) small teeth; movable finger with 3 (male) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 20B): trochanter granulate on all faces, femur and patella lightly granulate on prolateral margin, chelal hand with granulations on prolateral margin at base of fingers; trochanter 2.19–2.35 (male), femur 4.01–4.08 (male), patella 2.95–3.05 (male), chela (with pedicel) 3.64–3.76 (male), chela (without pedicel) 3.43–3.56 (male), hand (without pedicel) 1.39–1.48 (male) x longer than broad, movable finger

1.41–1.44 (male) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 20C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus within *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 31–36 (♂) low, retrorse teeth, most with strongly sinuate distal face; movable finger with ca. 1–5 (♂) low teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 20A): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 20 setae including 4 setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 7: 5: 6: 6: 7 (male).

Legs: femur + patella 2.27–2.36 (male) x longer than deep; subterminal tarsal setae trifurcate (Fig. 20E); arolium longer than claws, deeply divided (Fig. 20E).

Abdomen: tergites and sternites not divided; sclerites uniseriate. Tergal chaetotaxy: male, 4: 4: 6: 6: 7: 8: 8: 8: 6: 7 (including 4 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 7: (1) 14 [3 + 3] (1): (1) 8 (1): 10: 11: 11: 11: 9: 9: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac deeply bipartite.

Dimensions (mm): Males: holotype followed by paratype (where applicable): Body length ca. 2.0 (ca. 1.8). Pedipalp: trochanter 0.280/0.128 (0.258/0.110), femur 0.595/0.146 (0.589/0.147), patella 0.454/0.149 (0.448/0.152), chela (with pedicel) 0.976/0.268 (0.963/0.256), chela (without pedicel) 0.920 (0.912), hand (without pedicel) length 0.372 (0.378), movable finger length 0.536 (0.534). Chelicera 0.256/0.148. Carapace 0.575/0.433 (0.555/0.403); eye diameter 0.030. Leg I: femur 0.274/0.078, patella 0.137/0.072, tibia 0.224/0.053, metatarsus 0.134/0.042, tarsus 0.211/0.033. Leg IV: femur + patella 0.485/0.214 (0.467/0.198), tibia 0.340/0.084, metatarsus 0.175/0.061, tarsus 0.260/0.040.

Remarks.—*Albiorix puebla* is a small species that is similar to *A. retrodentatus*, but is substantially smaller and has trichobothrium ist_1 in a slightly different position. It is known only from a single location in the southeastern region of Puebla state, in southern Mexico, some 230 km east of *A. retrodentatus* and not far from the only known collection localities of *A. mirabilis* and *A. oaxaca* (Fig. 3C).

Etymology.—The specific epithet is a noun in apposition based on Puebla, the Mexican state in which the type locality is based.

Albiorix retrodentatus Hoff 1945
Figs. 3C, 21

Albiorix retrodentatus Hoff 1945:6–8, figs 10–16; Hoff 1958:15; Hoff 1959:4, etc.; Rowland and Reddell 1976:16; Harvey 1991:318; Ceballos 2004:428; Harvey 2013:unpaginated.

Albiorix bolivari Beier 1963:133–134, Fig. 1. **Syn. nov.**

Not *Albiorix retrodentatus* Hoff: Hoff 1956:25–26 (misidentification; see *Albiorix conodentatus* Hoff).

Material examined.—*Holotype of* A. retrodentatus. MEXICO: *Guerrero*: male, Mexcala (17°56′N, 99°37′W), 2 July 1941, L.I. Davis (AMNH, Hoff slide S–114.5–5453).

Paratype A. retrodentatus. MEXICO: *Guerrero*: 1 male, same data as holotype (AMNH, Hoff slide S–114.3–5202).

Paratypes of A. bolivari. MEXICO: *Guerrero:* 2 male, Gruta de Acuitlapán, 12 km NE. of Taxco (18°35′N, 99°35′W), 1,500 m, 5 May 1963, C. Bolivar *et al*. (CNAN, WM1820.01001–2).

Other material. MEXICO: *Michoacan:* 1 tritonymph, 5 miles SW. of Tiquicheo (18°51′N, 100°48′W), 8 July 1970, E. Fisher, P. Sullivan (UCDC).

Diagnosis.—The medial teeth of the fixed chelal finger of *A. retrodentatus* are similar to *A. puebla* as both have strongly sinuate distal margins, unlike all other species of the genus. *Albiorix retrodentatus* differs from *A. puebla* in its larger size and in the position of trichobothrium ist_1, which is slightly dorso-distal to ist_3 in *A. retrodentatus* but is directly dorsal to ist_3 in *A. puebla*.

Description.—*Adult:* Color: pedipalps and carapace deep red-brown; chelicerae and legs yellow-brown; tergites and sternites pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 3 (male) medium teeth, plus 4 very small distal teeth; movable finger with 4 (male) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 21B): trochanter with scattered granulations, strongest on retrolateral face, femur granulate on most faces, but strongest on prolateral surface, patella granulate on prolateral margin, chelal hand very sparsely granulate on prolateral margin at base of fingers; trochanter 2.10–2.57 (male), femur 4.01–4.08 (male), patella 2.71–3.10 (male), chela (with pedicel) 3.63–3.98 (male), chela (without pedicel) 3.44–3.78 (male), hand (without pedicel) 1.39–1.56 (male) x longer than broad, movable finger 1.44–1.50 (male) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 21C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 43–52 (male) low, retrorse teeth; movable finger with ca. 7–8 (male) low teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 21A): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 20 setae including 4 setae on anterior margin and 4 on

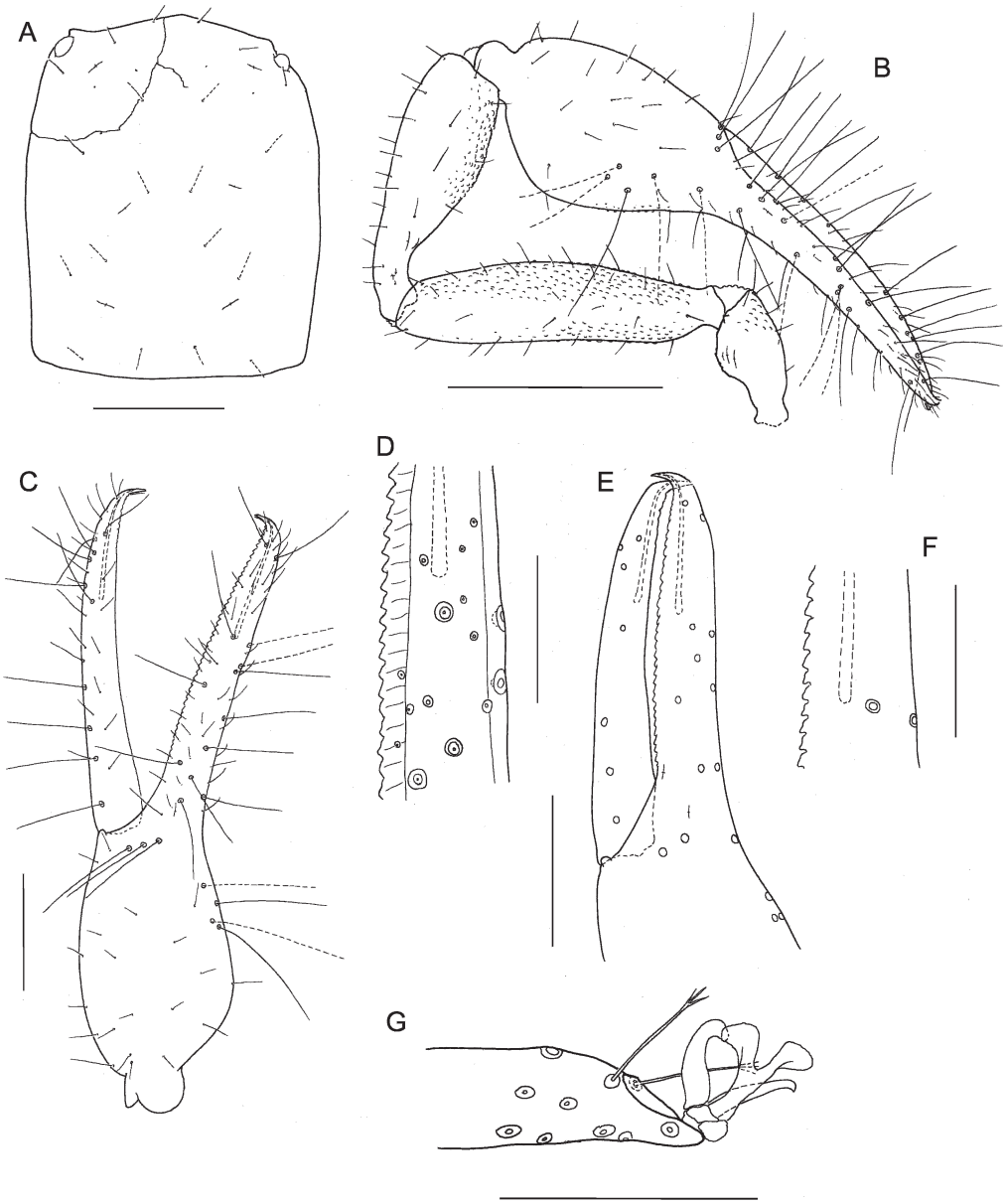

Figure 21.—*Albiorix retrodentatus* Hoff, male holotype, unless stated otherwise: A. Carapace, dorsal; B. Left pedipalp, dorsal; C. Left chela, lateral, male paratype; D. Detail of fixed chelal finger, male paratype; E. Left chela, tritonymph (UCDC); F. Detail of fixed chelal finger, tritonymph (UCDC); G. Tip of right tarsus IV, only subterminal tarsal setae shown. Scale lines = 0.5 mm (B, C); 0.25 mm (A); 0.2 mm (E); 0.1 mm (D, F, G).

posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 8: 7: 7: 8: 7 (male).

Legs: femur + patella 2.26–2.62 (male) x longer than deep; subterminal tarsal setae trifurcate (Fig. 21G); arolium longer than claws, deeply divided (Fig. 21G).

Abdomen: tergites and sternites not divided; sclerites uniseriate. Tergal chaetotaxy: male, 4: 7: 8: 8: 8: 8: 8: 8: 8: 8: 9 (including 2 tactile setae): 2. Sternal chaetotaxy: male, 8: (1) 12 [3 + 3] (1): (1) 7 (1): 13: 12: 11: 11: 11: 10: 8 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital deeply bipartite.

Dimensions (mm): Males: holotype followed by other males (where applicable): Body length 2.22 (2.35–2.61). Pedipalp: trochanter 0.326/0.155 (0.295–0.398/0.148–0.155), femur 0.784/0.192 (0.600–0.711/0.170–0.187), patella 0.650/0.210 (0.682–0.711/0.180–0.198), chela (with pedicel) 1.373/0.378 (1.065–1.448/0.320–0.370), chela (without pedicel) 1.301 (0.995–1.400), hand (without pedicel) length 0.525 (0.460–0.570), movable finger length 0.790 (0.770–0.848). Chelicera 0.301/0.156. Carapace 0.704/0.563 (0.651–0.720/0.503–0.611); eye diameter 0.078. Leg I: femur 0.0355/0.101, patella 0.193/0.095, tibia 0.296/0.063, metatarsus 0.167/0.051, tarsus 0.262/0.038. Leg IV: femur + patella 0.636/0.282 (0.620–0.675/0.265–

0.272), tibia 0.448/0.103, metatarsus 0.215/0.074, tarsus 0.339/0.050.

Tritonymph: Chelicera: galea long, slightly curved; hand with 6 setae, movable finger with 1 seta; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 1.99, femur 3.53, patella 3.79, chela (with pedicel) 3.33, chela (without pedicel) 3.11 × longer than broad. Fixed finger with 15 trichobothria, movable finger with 8 trichobothria (Fig. 21E); *eb*, *esb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *st* region with 1 trichobothrium; *t* region with 5 trichobothria; *isb* and *sb* absent. Chelal hand with retrolateral condyle small and rounded.

Carapace: anterior margin medially prominent; 1 pair of small eyes present; with 21 setae including 4 setae on anterior margin and 4 setae on posterior margin.

Coxal region: posterior maxillary lyrifissure present, subbasal.

Legs: much as in adults.

Dimensions (mm): Body length 2.35. Pedipalp: trochanter 0.295/0.148, femur 0.600/0.170, patella 0.682/0.180, chela (with pedicel) 1.065/0.320, chela (without pedicel) 0.995, hand (without pedicel) length 0.460, movable finger length 0.550. Carapace 0.651/0.503.

Remarks.—*Albiorix retrodentatus* was described by Hoff (1945) from two males collected in Guerrero state, in southern Mexico, but has rarely been mentioned since. Hoff (1956) identified two male specimens from Eddy County, New Mexico as *A. retrodentatus*. We have examined one of these specimens (from Whites City, erroneously called White City by Hoff) and found that it conforms very closely to specimens of *A. conodentatus* and that both samples were misidentified.

Beier (1963) described *A. bolivari* from a female holotype and six paratypes consisting of four males, a female and a tritonymph collected within Gruta de Acuitlapán, Guerrero, Mexico. We have had access to two of these male paratypes, which were slide-mounted by WBM. Beier (1963) justified *A. bolivari* as distinct from *A. magnus* based on several morphological differences and from *A. retrodentatus* on the slimmer pedipalpal segments. We find that while *A. bolivari* is indeed distinct from *A. conodentatus*, it cannot be easily separated from *A. retrodentatus*, with the chelae being nearly identical in size and shape. The type specimens of both species possess very characteristic teeth of the fixed chelal finger where the distal margins are sinuate, rather than straight. Hoff's (1945) description of *A. retrodentatus* included illustrations of the chelal teeth, but his Fig. 13 of the fixed finger failed to illustrate the sinuate shape. As we cannot find any other significant differences between the types of *A. retrodentatus* and *A. bolivari*, which were collected only 70 km from each other (Fig. 3C), we formally synonymize them, with *A. retrodentatus* taking priority over *A. bolivari*.

The tritonymph from Michoacan is tentatively associated with *A. retrodentatus*. The distal margins of the teeth of the fixed chelal finger are sinuate, but not strongly so, and may represent a different species. However, it was collected only 164 km from the type locality of *A. retrodentatus* and 133 km from the type locality of *A. bolivari.*

Albiorix retrodentatus is known only from a small region of southern Mexico, in the states of Guerrero and Michoacan (Fig. 3C).

Albiorix rosario Harvey & Muchmore sp. nov.
Figs. 3B, 22

Material examined.—*Holotype*. MEXICO: *Baja California:* male, 15 km E. of Rosario (30°04′N, 115°46′W), 7 February 1984–2 April 1985, pitfall trap, W.H. Clark (FSCA, WM7130.02001).

Diagnosis.—*Albiorix rosario* most closely resembles *A. edentatus* in having very low teeth of the fixed chelal finger that are much longer than high (Fig. 22D). It differs from *A. edentatus* in having bifurcate subterminal tarsal setae (Fig. 22E), and trichobothria *sb* and *st* situated much closer to each other than to b_2 (Fig. 22C).

Description.—*Adult:* Color: pedipalps, carapace and coxal region red-brown; abdomen pale red-brown; chelicera and legs light yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 3 (male) small teeth; movable finger with 2 (male) very small teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Figs. 22B, 22C): trochanter with scattered granulations, femur coarsely granulate on prolateral face and lightly granulate on retrolateral face, more prominent in basal half, and patella lightly granulate on prolateral face, chelal hand lightly granulate on prolateral surface at base of fingers, but smooth on retrolateral face; trochanter ? (damaged), femur 3.95 (male), patella 2.99 (male), chela (with pedicel) ? (poorly oriented), chela (without pedicel) ? (poorly oriented), hand (without pedicel) ? (poorly oriented) x longer than broad, movable finger 1.54 (male) x longer than hand (without pedicel). Fixed chelal finger and hand with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 22C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus within *est* region in fixed finger and at base of *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 29 (male) very low, retrorse teeth, each much longer than high; movable finger without any obvious teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 22A): lateral margins evenly convex; 1.25 (male) x longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with 20 (male) setae including 4 setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 7: 5: 5: 5: 6 (male).

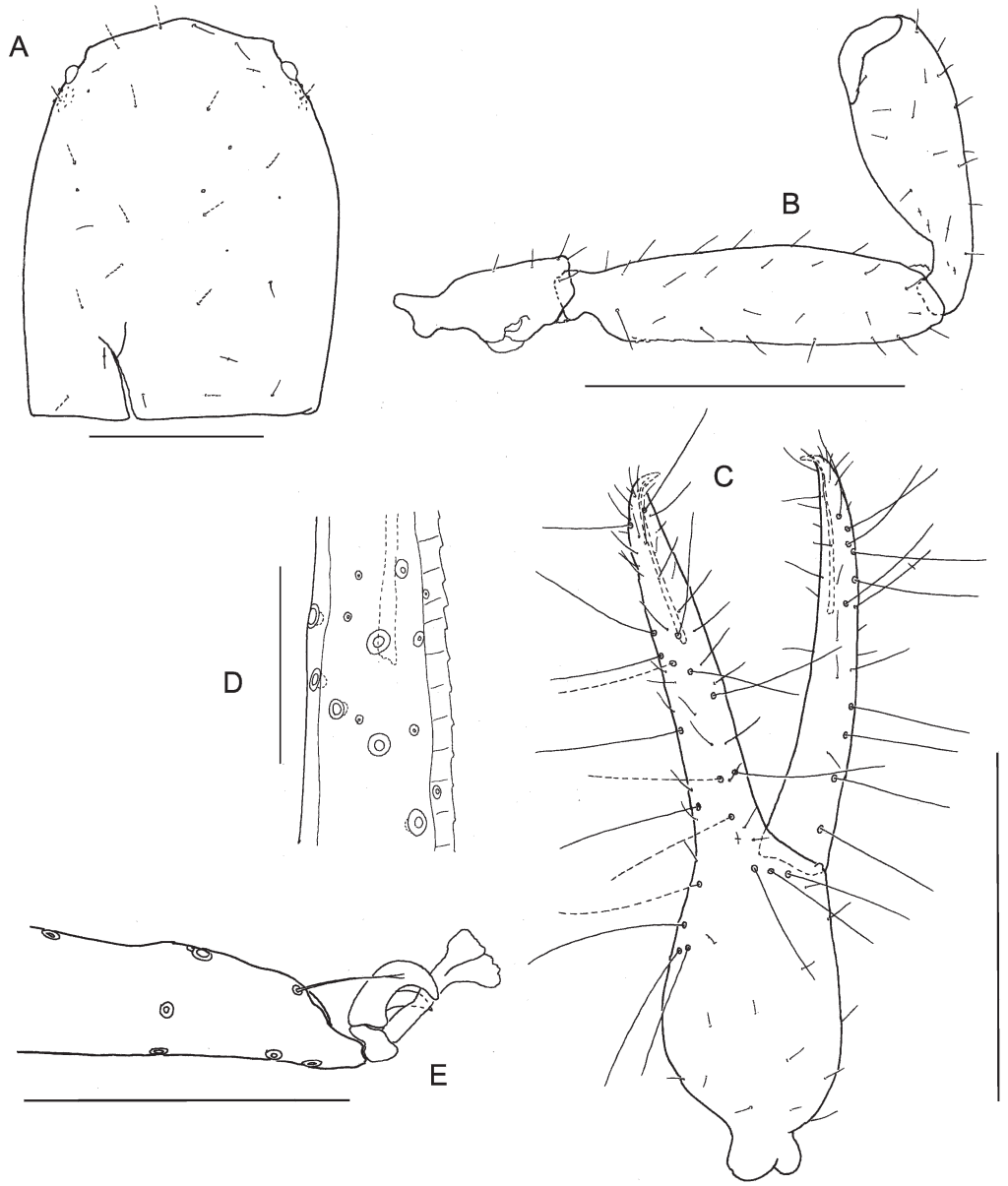

Figure 22.—*Albiorix rosario* Harvey & Muchmore sp. nov., male holotype: A. Carapace, dorsal; B. Right pedipalp, except chela, dorsal; C. Right chela, lateral; D. Detail of fixed chelal finger; E. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (A, B, C); 0.1 mm (D, E).

Legs: femur + patella 2.20 (male) x longer than deep; subterminal tarsal setae bifurcate, each tine short (Fig. 22E); arolium longer than claws, deeply divided (Fig. 22E).

Abdomen: tergites and sternites not divided; sclerites uniseriate, except for sternite II, which has scattered setae. Tergal chaetotaxy: male, 4: 4: 5: 8: 6: 6: 8: 6: 6: 8 (including 2 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 8: (1) 8 [2 + 3] (1): (1) 6 (1): 9: 9: 8: 9: 7: 6: 7 (including 3 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac bipartite.

Dimensions (mm): Male: holotype: Body length 1.94. Pedipalp: trochanter 0.280/? (damaged), femur 0.609/0.154, patella 0.479/0.160, chela (with pedicel) 1.021/? (poorly oriented), chela (without pedicel) 0.941, hand (without pedicel) length 0.385, movable finger length 0.592. Chelicera 0.223/0.112; movable finger length 0.132. Carapace 0.570/0.455; eye diameter 0.032. Leg I: femur 0.269/0.082, patella 0.147/0.077, tibia 0.214/0.054, metatarsus 0.188/0.044, tarsus 0.177/0.034. Leg IV: femur + patella 0.466/0.212, tibia 0.327/0.090, metatarsus 0.154/0.064, tarsus 0.230/0.044.

Remarks.—The holotype and only known specimen of *A. rosario* is missing the left pedipalp, and the right chela is mounted in a lateral view. Therefore, it is not possible to calculate the width of the chelal hand.

Albiorix rosario has only been found at a single location in northern Baja California, Mexico (Fig. 3B).

Etymology.—The specific epithet is a noun in apposition based on the type locality, El Rosario.

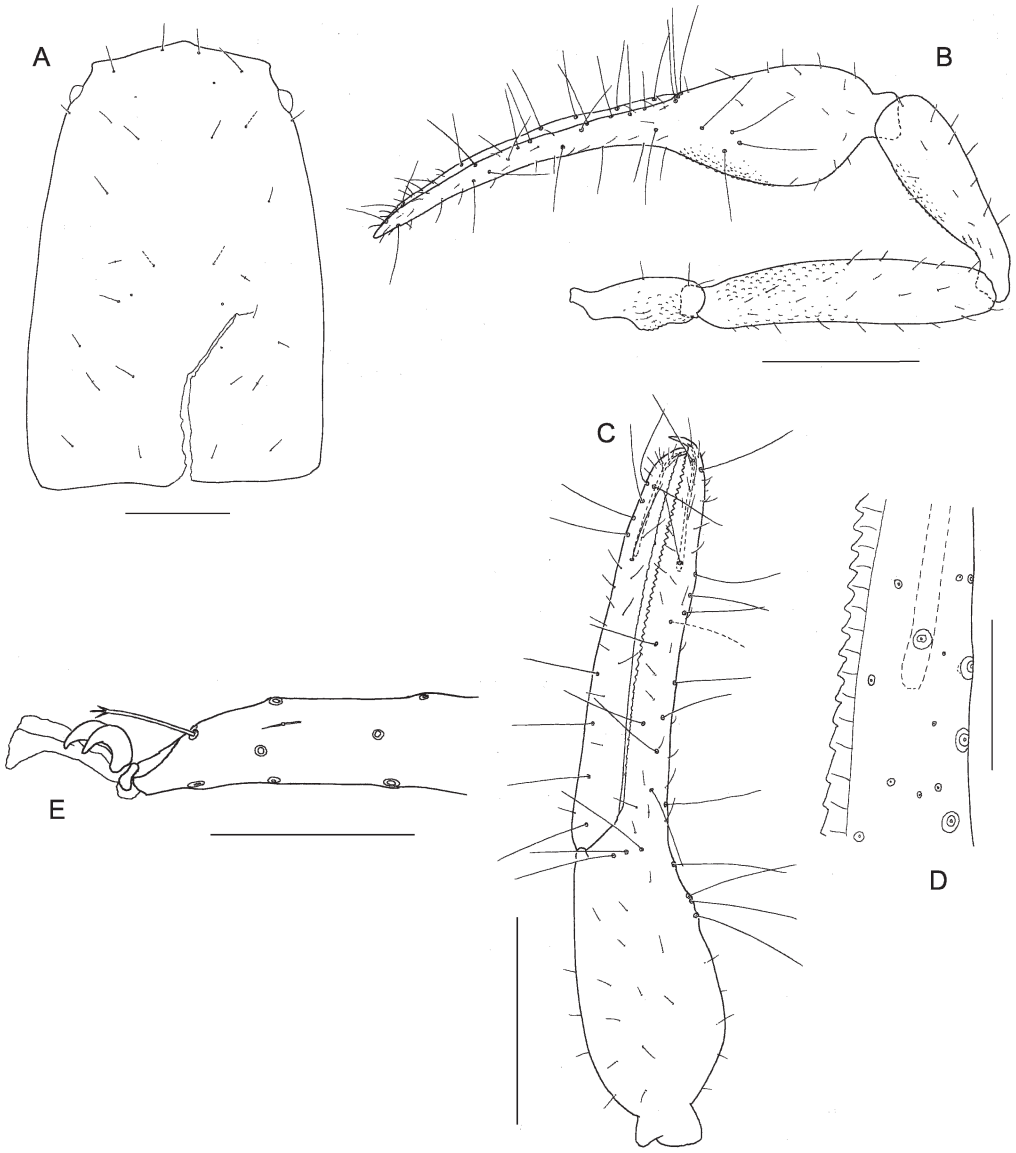

Figure 23.—*Albiorix sarahae* Harvey & Muchmore sp. nov., male holotype: A. Carapace, dorsal; B. Right pedipalp, dorsal; C. Left chela, lateral; D. Detail of fixed chelal finger; E. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (B, C); 0.2 mm (A); 0.1 mm (D, E).

Albiorix sarahae Harvey & Muchmore sp. nov.
Figs. 3A, 23

Material examined.—*Holotype*. USA: *California*: male, San Bernardino County, Soda Lake Zzyxx Field Station (35°10.323′N, 116°06.596′W), 12–14 April 2005, under rocks on hillside, S. Crews (CAS).

Paratype. USA: *California*: 1 female, Inyo County, Death Valley National Park, Highway 178, 1.8 miles E. of Salsberry Gap (35°56.961′N, 116°24.793′W), 1,270 feet, 23 September 2001, rocky alluvial fan, M. Hedin, S. Crews, J. Starrett (CAS).

Diagnosis.—*Albiorix sarahae* most closely resembles *A. vigintus* and *A. gertschi* in the position of trichobothrium ib_5 which is displaced distally. It differs from both these species by the presence of 21 trichobothria, in which the missing trichobothrium is ist_1.

Description.—*Adult:* Color: pedipalps, coxae and carapace deep yellow-brown, legs and chelicerae pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 4 (male), 6 (female) small teeth; movable finger with 5 (male), 4 (female) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 23B): trochanter with scattered granulations, more prominent on retrolateral margins, femur coarsely granulate on prolateral surface, lightly granulate elsewhere, patella lightly granulate on prolateral surface, chelal hand lightly granulate on prolateral and retrolateral surface at base of fingers; trochanter 2.51 (male), 2.53 (female), femur 5.08 (male), 4.37 (female), patella 3.40 (male), 3.06 (female), chela

(with pedicel) 4.37 (male), 3.69 (female), chela (without pedicel) 4.16 (male), 3.50 (female), hand (without pedicel) 1.58 (male), 1.43 (female) x longer than broad, movable finger 1.67 (male), 1.46 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 21 trichobothria, movable chelal finger with 10 trichobothria (Fig. 23C): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 4 trichobothria, ib_5 displaced distally in advance of *eb*, *esb* and *isb*; *ist* region with 6 trichobothria, ist_1 absent; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus at distal end of *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 53 (male), 44 (female) low, retrorse teeth; movable finger with 10 (male), 6 (female) obvious, low teeth, followed by additional very low teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 23A): lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 24 (male), 22 (female) setae including 4 setae on anterior margin and 4 on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 8: 4: 5: 5: 7 (male); 2 + 8: 5: 5: 5: 6 (female).

Legs: femur + patella 2.71 (male), 2.87 (female) x longer than deep; subterminal tarsal setae trifurcate (Fig. 23E); arolium longer than claws, deeply divided (Fig. 23E).

Abdomen: tergites and sternites not divided; sclerites uniseriate. Tergal chaetotaxy: male, 4: 4: 6: 6: 6: 6: 6: 8: 8: 8: 8 (including 4 tactile setae): 2; female, 4: 4: 4: 8: 8: 8: 8: 9: 8: 7: 8 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 6: (1) 13 [3 + 3] (1): (1) 6 (1): 12: 10: 10: 9: 10: 8: 5 (including 3 tactile setae): 2; female, 6: (1) 6 (1): (1) 8 (1): 10: 10: 9: 9: 8: 9: 10 (including 4 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac bipartite; female with large gonosac, which is covered with scattered pores.

Dimensions (mm): Males: holotype: Body length 2.22. Pedipalp: trochanter 0.402/0.160, femur 1.000/0.197, patella 0.720/0.212, chela (with pedicel) 1.660/0.380, chela (without pedicel) 1.580, hand (without pedicel) length 0.600, movable finger length 1.003. Chelicera 0.323/0.142, movable finger length 0.190. Carapace 0.845/0.555; eye diameter 0.040. Leg I: femur 0.461/0.109, patella 0.261/0.098, tibia 0.360/0.065, metatarsus 0.207/0.050, tarsus 0.305/0.038. Leg IV: femur + patella 0.752/0.277, tibia 0.543/0.111, metatarsus 0.255/0.077, tarsus 0.390/0.050.

Female: paratype: Body length 2.08. Pedipalp: trochanter 0.418/0.165, femur 0.895/0.205, patella 0.700/0.229, chela (with pedicel) 1.590/0.431, chela (without pedicel) 1.507, hand (without pedicel) length 0.618, movable finger length 0.900. Chelicera 0.330/0.158, movable finger length 0.188. Carapace 0.792/0.540; eye diameter 0.040. Leg I: femur 0.425/0.103, patella 0.215/0.092, tibia 0.321/0.064, metatarsus 0.180/0.054, tarsus 0.387/0.041. Leg IV: femur + patella 0.700/0.244, tibia 0.502/0.109, metatarsus 0.251/0.070, tarsus 0.380/0.048.

Remarks.—This species is known from two localities situated in the Mojave Desert in eastern California (Fig. 3A).

Etymology.—This species is named for Sarah Crews, who collected both specimens.

Albiorix vigintus Harvey & Muchmore sp. nov.
Figs. 3A, 24

Albiorix mexicanus Chamberlin 1930:45 (in part, specimen from Nevada).

Material examined.—*Holotype*. USA: *Utah*: male, Saint George, Washington County (37°06′N, 113°35′W), 26 April 1935, G.F. Knowlton, C.F. Smith (CAS, JC–1069.01001).

Paratypes. USA: *Arizona*: 2 males, 3 miles N., 7 miles E. of Littlefield, Virgin River, Mohave County (36°57′N, 113°48′W), 28 March–1 October 1982, D. Giuliani (FSCA, WM7705); *Nevada*: 1 male, Newberry Mts. at Pipe Springs Road junction, Clark County (35°16′N, 114°41′W), 28 September–7 October 1994, *Larrea* desert, W.L. Pratt (CAS); *Utah*: 1 male, collected with holotype (CAS, JC–1069.01002); 1 male, 2 miles E. of Washington, Washington County (37°08′N, 113°26′W), 20 May–8 June 1980, pit trap, sandy sagebrush and creosote area, R. Hardy (FSCA, WM5805.01001); 1 female, Saint George, Washington County (37°06′N, 113°35′W), 19 March 1924, V.M. Tanner (CAS, JC–245.01001).

Diagnosis.—*Albiorix vigintus* most closely resembles *A. gertschi* and *A. sarahae* in having trichobothrium ib_5 situated distally (Fig. 24A), but unlike these two species, which have 22 and 21 trichobothria on the fixed chelal finger and hand, respectively, it has only 20 trichobothria with only 4 trichobothria in the *ist* group (Figs. 24A, 24B).

Description.—*Adult:* Color: pedipalps, coxae and carapace deep yellow-brown, legs and chelicerae pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with 5 (male), 6 (female) small teeth; movable finger with 5 (male), 5 (female) teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp (Fig. 24A): trochanter with scattered granulations, femur coarsely granulate on most faces, more strongly granulate on prolateral face, patella coarsely granulate on prolateral face, chelal hand lightly granulate on prolateral and retrolateral surfaces at base of fingers; trochanter 2.18–2.37 (male), 2.41–2.50 (female), femur 4.43–4.82 (male), 4.39–4.67 (female), patella 2.85–3.67 (male), 3.30–3.58 (female), chela (with pedicel) 3.92–4.18 (male), 3.78–4.13 (female), chela (without pedicel) 3.75–3.95 (male), 3.69–3.93 (female), hand (without pedicel) 1.54–1.63 (male), 1.49–1.59 (female) x longer than broad, movable finger 1.39–1.55 (male), 1.45–1.61 (♀female) x longer than hand (without pedicel). Fixed chelal finger and hand with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 24B): *eb*, *esb* and *isb* in straight row at base of finger; *eb*, *esb*, *isb*, *it* and *et* regions each with 1 trichobothrium; *ib* region with 5 trichobothria, ib_5 displaced

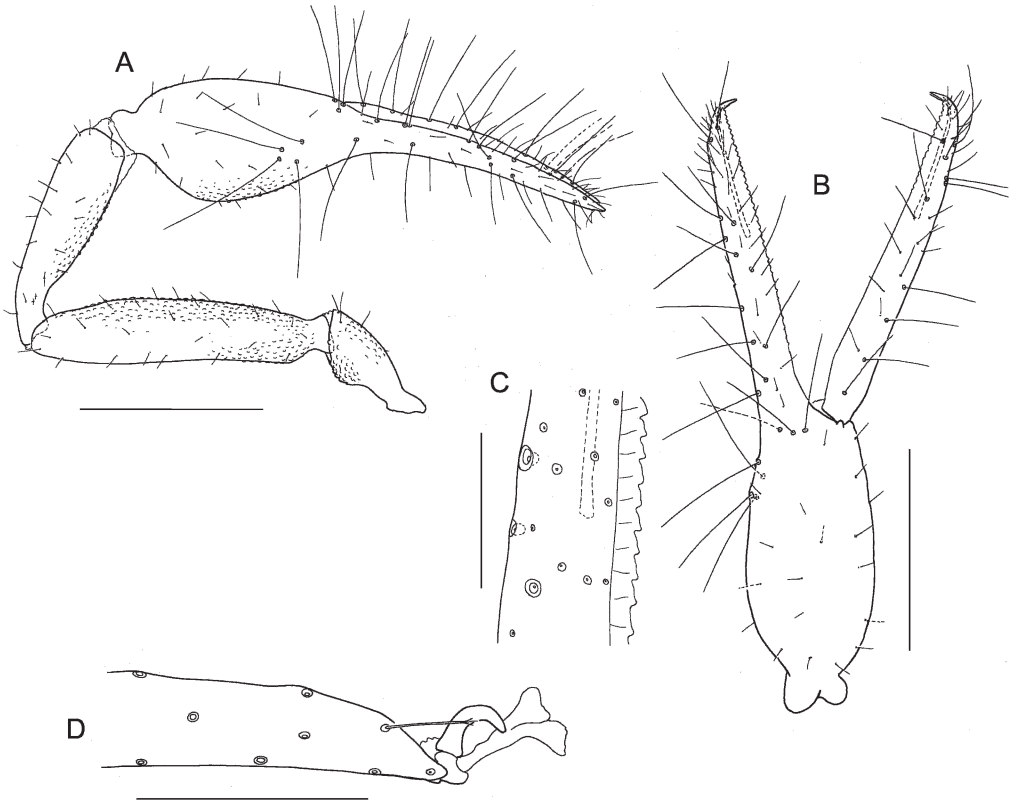

Figure 24.—*Albiorix vigintus* Harvey & Muchmore sp. nov., male holotype: A. Left pedipalp, dorsal; B. Right chela, lateral; C. Detail of fixed chelal finger; D. Tip of right tarsus IV, only subterminal tarsal seta shown. Scale lines = 0.5 mm (A, B); 0.1 mm (C, D).

distally in advance of *eb*, *esb* and *isb*; *ist* region with 4 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *sb* and *st* regions each with 1 trichobothrium; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus within *est* region in fixed finger and basal to *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth evenly spaced and juxtadentate: fixed finger with 39–52 (male), 50–54 (female) low, retrorse teeth (Fig. 24C); movable finger with ca. 9–16 (male), 12–15 (female) obvious, low teeth, followed by additional very low teeth; base of fixed chelal finger with several small denticles.

Carapace: lateral margins evenly convex; with 2 small bulging eyes; anterior margin medially prominent; with 22–25 (male), 22 (female) setae including 4 setae on anterior margin and 4 (occasionally 3) on posterior margin; with very faint posterior furrow situated close to posterior margin.

Coxal region: manducatory process somewhat pointed, with 2 long apical acuminate setae; chaetotaxy 2 + 7: 6: 7: 6: 7 (male); 2 + 7: 5: 6: 5: 6 (female).

Legs: femur + patella 2.25–2.38 (male), 2.73–2.77 (female) x longer than deep; subterminal tarsal setae trifurcate (Fig. 24D); arolium longer than claws, deeply divided (Fig. 24D).

Abdomen: tergites and sternites not divided; sclerites uniseriate, except for male sternites II and III where the setae are scattered. Tergal chaetotaxy: holotype male, 4: 5: 5: 6: 7: 7: 8: 8: 6: 8 (including 4 tactile setae): 7 (including 4 tactile setae): 2; female, 3: 4: 5: 6: 7: 8: 6: 6: 6: 6 (including 2 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: holotype male, 6: (1) 11 [3 + 3] (1): (1) 7 (1): 8: 9: 8: 9: 9: 8: 8 (including 4 tactile setae): 2; female, 6: (1) 6 (1): (1) 6 (1): 8: 8: 8: 8: 7: 8: 8 (including 4 tactile setae): 2; setae of anterior genital operculum (sternite II) of female very small. Setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac bipartite; female with large gonosac, which is covered with scattered pores.

Dimensions (mm): Males: holotype followed by other males (where applicable): Body length 2.46 (1.73–2.68). Pedipalp: trochanter 0.367/0.157 (0.294–0.371/0.135–0.161), femur 0.834/0.173 (0.773–0.856/0.170–0.180), patella 0.635/0.173 (0.493–0.654/0.173–0.186), chela (with pedicel) 1.376/0.340 (1.328–1.472/0.339–0.352), chela (without pedicel) 1.320 (1.270–1.392), hand (without pedicel) length 0.554 (0.522–0.574), movable finger length 0.768 (0.760–0.835). Chelicera 0.309/0.156; movable finger length 0.184. Carapace ?/? (damaged) (0.603–0.708/?); eye diameter 0.038. Leg I: femur 0.400/0.099, patella 0.201/0.087, tibia 0.312/0.061, metatarsus 0.167/0.049, tarsus 0.253/0.040. Leg IV: femur + patella 0.656/0.291 (0.653/0.274), tibia 0.460/0.111, metatarsus 0.231/0.070, tarsus 0.333/0.045.

Females: paratype (JC–245.01001) followed by other females (where applicable): Body length 2.65 (1.76–2.45). Pedipalp: trochanter 0.420/0.168 (0.380–0.388/0.158–0.157), femur 0.941/0.202 (0.835–0.920/0.190–0.197), patella 0.686/

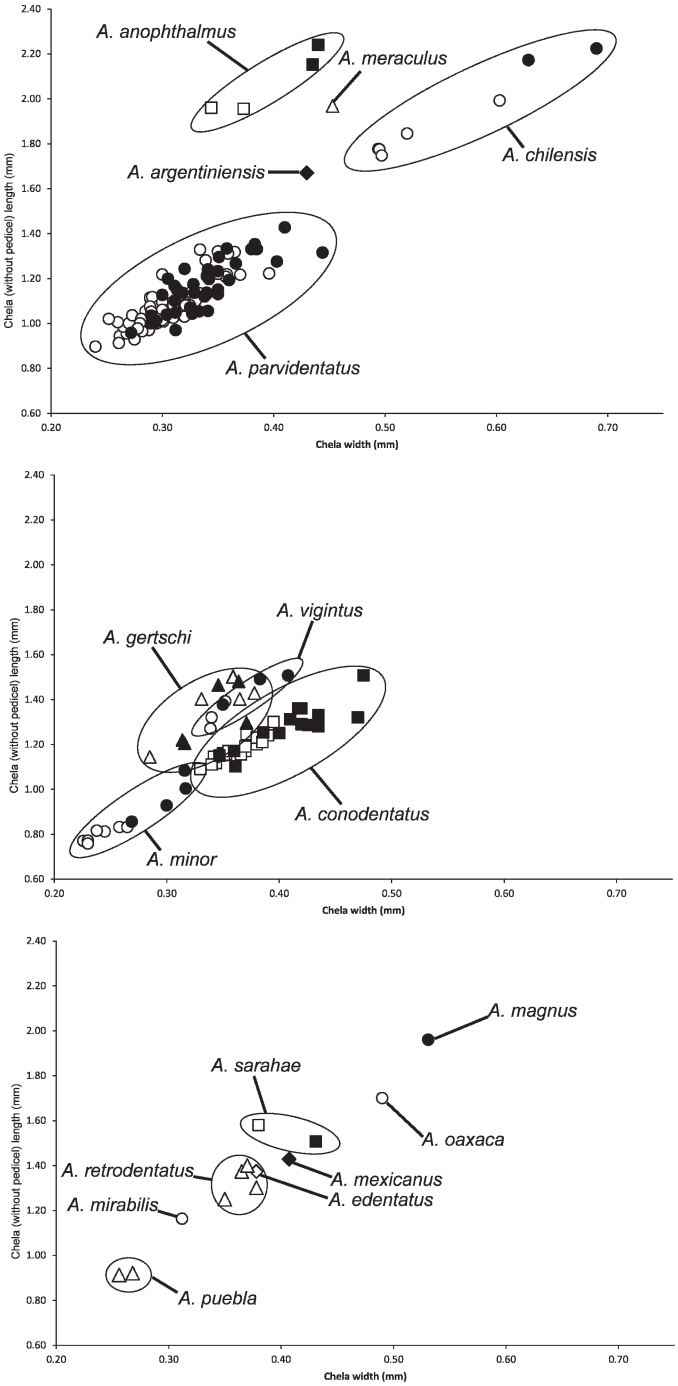

Figure 25.—Graph depicting chela (without pedicel) length versus chela width, for all *Albiorix* spp. except *A. rosario* Harvey & Muchmore sp. nov. as the sole specimen has the chela mounted laterally.

0.196 (0.610–0.681/0.185–0.190), chela (with pedicel) 1.544/0.408 (but slightly damaged and flattened) (1.446–1.556/0.350–0.383), chela (without pedicel) 1.506 (1.377–1.490), hand (without pedicel) length 0.616 (0.555–0.571), movable finger length 0.896 (0.825–0.917). Chelicera 0.344/0.168, movable finger length 0.205. Carapace 0.778/? (damaged) (0.740–0.743/0.504–0.524); eye diameter 0.045. Leg I: femur 0.422/0.109, patella 0.208/0.097, tibia 0.331/0.066, metatarsus 0.181/0.057, tarsus 0.275/0.040. Leg IV: femur + patella 0.701/0.257 (0.710/0.256), tibia 0.481/0.104, metatarsus 0.243/0.071, tarsus 0.352/0.051.

Remarks.—This species is known from a small area of the Rocky Mountains in south-western Utah, southern Nevada and north-western Arizona (Fig. 3A).

Etymology.—The specific epithet refers to the presence of only 20 trichobothria on the fixed chelal finger and hand (*viginti*, Latin, twenty).

Genus *Ideoroncus* Balzan 1887

Ideoroncus Balzan 1887: no pagination; Balzan 1890:443–444; Chamberlin 1930:44; Beier 1932a:171–172; Mahnert 1984a:653; Harvey 1991:319; Harvey 2013:unpaginated.

Ideobisium (Ideoroncus) Balzan: Balzan 1892:540; With 1906:81.

Type species.—*Ideoroncus pallidus* Balzan 1887, by monotypy.

Diagnosis.—Species of *Ideoroncus* differ from all other ideoroncid genera by the dorsal displacement of trichobothrium *sb* on the movable chelal finger.

Description.—*Adult:* setae: long, straight and acicular.

Chelicera: hand with 5 or occasionally 6 setae; movable finger with 1 long subdistal seta; rallum of 4 thickened blades, all blades serrate; lamina exterior absent; galea long and slender.

Pedipalps: long and slender. Patella with disto-prolateral excavation. Fixed chelal finger and hand with 20 or 21 trichobothria (rarely 22), movable chelal finger with 10 trichobothria: *eb* region with 1 trichobothrium; *est* region with 6 trichobothria; *ib* region with 4 trichobothria; *ist* region with 5 or 6 trichobothria; *b* region with 2 trichobothria; *sb* and *st* regions with 1 trichobothrium; and *t* region with 6 trichobothria; *sb* dorsally displaced relative to *st*; *st* not ventrally displaced. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus distal to *est* region in fixed finger and near *t* region in movable finger. Chelal teeth small and evenly spaced; base of fixed chelal finger with several small denticles. Chelal hand with retrolateral condyle small and rounded.

Carapace: with 2 small, bulging eyes, or eyes absent; with or without basal furrow; anterior margin with 6, or occasionally 4 or 8 setae.

Coxal region: manducatory process with 2 long distal setae. Median maxillary lyrifissure present and sub-basally situated.

Legs: femur I and II without basal swelling; femora I and II with primary slit sensillum directed transversely; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; metatarsal pseudotactile seta sub-proximal; legs with dentate subterminal tarsal setae; arolium about as long as the claws, not divided, without ventral hooked protuberance; without sub-ungual spine; claws slender and simple.

Abdomen: tergites undivided; sternites with faint medial suture line. Pleural membrane longitudinally striate. Each stigmatic sclerite with 1 seta; spiracles simple, with spiracular helix. Anterior margin of anal operculum not abutting posterior margin of sternite X.

Genitalia: male median genital sac bipartite; female with large gonosac covered with scattered pores.

Tritonymph: Pedipalps: fixed finger with 14 trichobothria, movable finger with 8 trichobothria; *eb* region with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* distal to *it*; *b* region with 2 trichobothria; *t* region with 5 trichobothria; *isb* and *st* absent.

Deutonymph: Pedipalps: fixed finger with 9 trichobothria, movable finger with 6 trichobothria; *eb* region with 1 trichobothrium; *ib* region with 2 trichobothria; *ist* region with 2 trichobothria; *est* region with 2 trichobothria; *et* distal to *it*; *b* region with 2 trichobothria; *t* region with 4 trichobothria; others absent.

Protonymph: Pedipalps: *eb*, *et*, *ist* and *t* regions each with 1 trichobothrium; others absent.

Remarks.—The genus *Ideoroncus* is currently known from nine species distributed in Paraguay and southern Brazil (Mahnert 1984a, 2001; Harvey 2013) (Figs. 2B, 26A, 27B).

KEY TO SPECIES OF *IDEORONCUS* (ADAPTED FROM MAHNERT 1984A)

1. Eyes present 2
   Eyes absent 8
2. Fixed chelal finger and hand with 20 trichobothria, including *ist* region with 5 trichobothria 3
   Fixed chelal finger and hand with 21 trichobothria, including *ist* region with 6 trichobothria 6
3. Eyes small . . . . . *I. pallidus*
   Eyes large 4
4. Carapace with subbasal thickened band 5
   Carapace without subbasal thickened band . . . . . *I. paranensis*
5. Pedipalpal femur 0.49 (male), 0.51 (female) mm in length; 3.5–3.9 × longer than broad; pedipalpal tibia 2.5–2.8 × longer than broad; tergite IX with 9–11 setae . . . . . *I. lenkoi*
   Pedipalpal femur at least 0.51 (msle), 0.58 (female) mm in length; 3.8–4.3 × longer than broad; pedipalpal tibia 2.7–3.0 × longer than broad; tergite IX with 13–15 setae . . . . . *I. setosus*
6. Smaller and slightly thicker appendages, e.g. pedipalpal femur of male 0.55–0.63 mm, of female 0.65–0.77 mm long, and 3.7–4.1 × longer than broad 7
   Larger and thinner appendages, e.g. pedipalpal femur of male 0.70–0.72 mm long, and 4.5 × longer than broad . . . . *I. procerus*
7. Pedipalps uniformly yellow-brown; carapace and tergites brown; tergite IX with 11–15 setae; pedipalpal femur 3.7–4.1 × longer than broad . . . . . *I. divisus*
   Pedipalps red brown, hand slightly darker; carapace and tergites dark chocolate brown; tergite IX with 8–11 setae; pedipalpal femur 3.8–3.9 × longer than broad . . . . . *I. beieri*
8. Pedipalps slender, e.g., pedipalpal femur 5.5–5.7 × longer than broad . . . . . *I. cavicola*
   Pedipalps less slender, e.g., pedipalpal femur 3.3 × longer than broad . . . . . *I. anophthalmus*

Ideoroncus anophthalmus Mahnert 1984
(Fig. 26A)

Ideoroncus anophthalmus Mahnert 1984a:663–665, figs 22–24; Harvey 1991:319; Harvey 2013:unpaginated.

Material examined.—None.

Diagnosis.—*Ideoroncus anophthalmus* resembles *I. cavicola* in the lack of eyes, but differs in having less slender appendages; e.g., pedipalpal femur 3.3 × longer than broad, compared with 5.5–5.7 × in *I. cavicola*.

Description.—*Adults:* See Mahnert (1984a).

Remarks.—This species only occurs in São Paulo state, Brazil (Mahnert 1984a) (Fig. 26A).

Ideoroncus beieri Mahnert 1984
Fig. 26B

Ideoroncus lenkoi Beier: Beier 1974:899 (misidentification, in part).
Ideoroncus beieri Mahnert 1984a:668–670, figs 34–37; Harvey 1991:319; Harvey 2013:unpaginated.

Material examined.—None.

Diagnosis.—*Ideoroncus beieri* resembles *I. procerus* and *I. divisus* in having 21 trichobothria on the fixed chelal finger and hand, but has much darker pedipalps, carapace and tergites, and slightly different pedipalpal ratios.

Description.—*Adult:* See Mahnert (1984a).

Remarks.—*Ideoroncus beieri* occurs in Paraná state, Brazil (Mahnert 1984a) (Fig. 26B).

Ideoroncus cavicola Mahnert 1984
Fig. 26A

Ideoroncus cavicola Mahnert 2001:103–106, figs 17–21.

Material examined.—None.

Diagnosis.—*Ideoroncus cavicola* resembles *I. anophthalmus* in the lack of eyes, but differs in having more slender appendages; e.g., pedipalpal femur 5.5–5.7 × longer than broad, compared with 3.3 × in *I. anophthalmus*.

Description.—*Adult:* See Mahnert (1984a, 2001).

Remarks.—*Ideoroncus cavicola* is known from caves in the Iporanga district of São Paulo state, Brazil (Mahnert 2001) (Fig. 26A).

Ideoroncus divisus Mahnert 1984
Fig. 26B

Ideoroncus pallidus Balzan: Beier 1974:899 (misidentification).
Ideoroncus divisus Mahnert 1984: 666–668, Figs. 29–33; Harvey 1991:319; Harvey & Volschenk 2007:368, Figs. 1–4; Harvey 2013:unpaginated.

Material examined.—*Paratypes*. **Brazil:** *Santa Catarina*: 1 ♂, Nova Teutonia [27°03′S, 52°24′W], January 1965, F. Plau-

mann (WAM T90/1164); 1 ♀, same data except June 1957 (WAM T90/1165).

Diagnosis.—*Ideoroncus divisus* resembles *I. procerus* and *I. beieri* in having 21 trichobothria on the fixed chelal finger and hand, but has smaller and slightly thicker pedipalpal segments than *I. procerus*, and has lighter colored pedipalps, carapace and tergites, and more setae on tergite IX than *I. beieri*.

Description.—*Adult:* See Mahnert (1984a).

Nymphs: See Mahnert (1984a).

Remarks.—This species is known from the Brazilian states of Rio Grande do Sul and Santa Catarina (Mahnert 1984a) (Fig. 26B).

Ideoroncus lenkoi Beier 1970
Fig. 26B

Ideoroncus lenkoi Beier 1970:55–56, Fig. 3; Beier 1974:899 (in part; see *Ideoroncus beieri* Mahnert); Mahnert 1984a:655–656, Figs. 3–7; Harvey 1991:319; Harvey et al. 2007:Fig. 4; Harvey 2013:unpaginated.

Ideoroncus aff. *lenkoi* Beier: Mahnert 1984a:657.

Not *Ideoroncus lenkoi* Beier: Beier 1974:899 (misidentification, in part; see *Ideoroncus beieri* Mahnert and *I. paranensis* Mahnert).

Material examined.—BRAZIL: *São Paulo:* São Sebastiao, Station Biologique (23°49′S, 45°27′W), 25 June 1960, Buchswald, R. Schuster (WAM T90/1166–1167).

Diagnosis.—*Ideoroncus lenkoi* resembles *I. anophthalmus*, *I. cavicola*, *I. pallidus, I. paranensis* and *I. setosus* in having 20 trichobothria on the fixed chelal finger and hand, but has larger eyes, unlike *I. anophthalmus* and *I. cavicola* which are eyeless, and *I. pallidus*, which has very small eyes, has a thickened subbasal band on the carapace not found in *I. paranensis*, and the high number of setae (13–15) on tergite IX found in *I. setosus*.

Description.—*Adult:* See Mahnert (1984a).

Nymphs: See Mahnert (1984a).

Remarks.—This species was originally described from São Paulo state, Brazil, and redescribed by Mahnert (1984a) (Fig. 26B).

Ideoroncus pallidus Balzan 1887
Fig. 26A

Ideoroncus pallidus Balzan 1887: no pagination, figs; Balzan 1890:444–445, Figs. 23, 23a–b; Chamberlin 1930:44; Beier 1932a:171, Fig. 201; Roewer 1937:257; Mahnert 1984a:653–655, Figs. 1–3; Harvey 1991:319; Harvey 2013:unpaginated.

Ideobisium (Ideoroncus) pallidum (Balzan): Balzan 1892:541, 549.

Ideobisium pallidum (Balzan): Ellingsen 1910:395.

Not *Ideoroncus pallidus* Beier: Beier 1974:899 (misidentification; see *Ideoroncus divisus* Mahnert).

Material examined.—None.

Diagnosis.—*Ideoroncus pallidus* resembles *I. anophthalmus*, *I. cavicola*, *I. lenkoi*, *I. paranensis* and *I. setosus* in having 20 trichobothria on the fixed chelal finger and hand, but has very small eyes, unlike *I. anophthalmus* and *I. cavicola*, which are eyeless, and *I. lenkoi*, *I. paranensis* and *I. setosus*, which have larger eyes.

Description.—*Adult:* See Mahnert (1984a).

Remarks.—*Ideoroncus pallidus* is known only from the type material collected at Rio Apa, Paraguay (Fig. 26A). The status of the specimens from Brazil as *Ideobisium pallidum* by (Ellingsen 1910) is unknown.

Ideoroncus paranensis Mahnert 1984
Fig. 26A

Ideoroncus lenkoi Beier: Beier 1974:899 (misidentification, in part).

Ideoroncus paranensis Mahnert 1984: 657–659, Figs. 8–14; Harvey 1991:320; Harvey 2013:unpaginated.

Material examined.—None.

Diagnosis.—*Ideoroncus paranensis* resembles *I. anophthalmus*, *I. cavicola*, *I. lenkoi*, *I. pallidus* and *I. setosus* in having 20 trichobothria on the fixed chelal finger and hand, but has larger eyes, unlike *I. anophthalmus* and *I. cavicola*, which are eyeless, and *I. pallidus*, which has very small eyes, and lacks a thickened subbasal band on the carapace found in *I. lenkoi* and *I. setosus*.

Description.—*Adult:* See Mahnert (1984a).

Nymphs: See Mahnert (1984a).

Remarks.—*Ideoroncus paranensis* has only been collected from Paraná state, Brazil (Mahnert 1984a) (Fig. 26A).

Ideoroncus procerus Beier 1974
Fig. 26A

Ideoroncus procerus Beier 1974:900–901, Fig. 1; Mahnert 1984a:665–666, Figs. 25–28; Harvey 1991:320; Harvey 2013:unpaginated.

Material examined.—None.

Diagnosis.—*Ideoroncus procerus* resembles *I. setosus* and *I. beieri* in having 21 trichobothria on the fixed chelal finger and hand, but is larger with a pedipalpal femur length of 0.70–0.72 (male), compared with at most 0.63 mm in *I. setosus* and *I. beieri*.

Description.—*Adult:* See Mahnert (1984a).

Remarks.—*Ideoroncus procerus* was originally described from Nova Teutônia, Santa Catarina state, Brazil (Beier 1974) (Fig. 26A) and redescribed by Mahnert (1984a).

Ideoroncus setosus Mahnert 1984
Fig. 26A

Ideoroncus setosus Mahnert 1984:659–663, Figs. 15–21; Harvey 1991:320; Mahnert 2001:103; Harvey 2013:unpaginated.

Material examined.—None.

Diagnosis.—*Ideoroncus setosus* resembles *I. anophthalmus*, *I. cavicola*, *I. lenkoi*, *I. pallidus* and *I. paranensis* in having 20 trichobothria on the fixed chelal finger and hand, but has larger eyes, unlike *I. anophthalmus* and *I. cavicola*, which are eyeless, and *I. pallidus*, which has very small eyes, has a thickened subbasal band on the carapace not found in *I. paranensis*, and lower numbers of setae (9–11) on tergite IX found in *I. lenkoi*.

Description.—*Adult:* See Mahnert (1984a).

Nymphs: See Mahnert (1984a).

Remarks.—*Ideoroncus setosus* is recorded from São Paulo state, Brazil (Mahnert 1984a, 2001) (Fig. 26A).

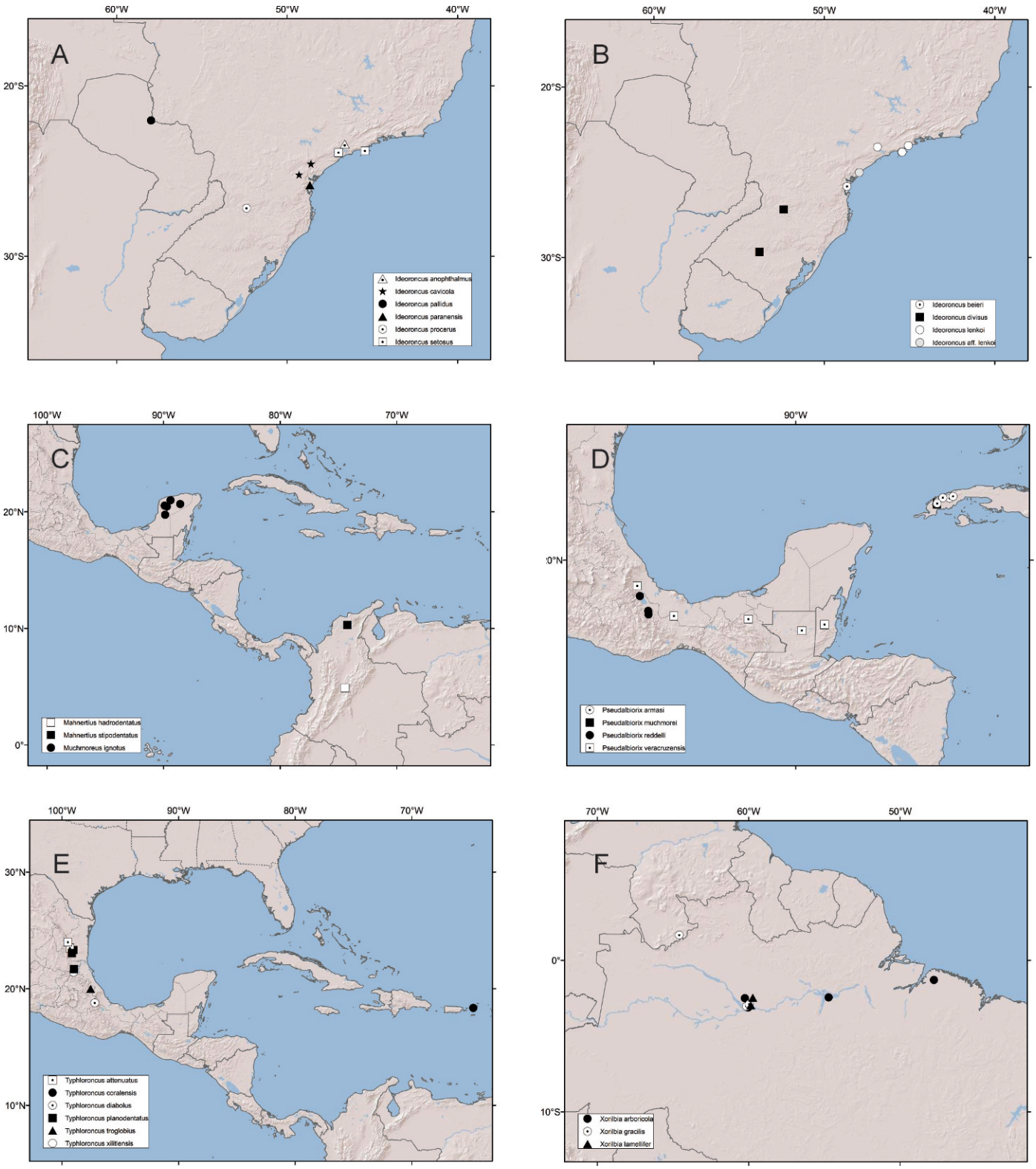

Figure 26.—Distribution of species of Ideoroncidae: A, B. *Ideoroncus* spp.; C. *Mahnertius* and *Muchmoreus*; D. *Pseudalbiorix* spp.; E. *Typhloroncus* spp.; F. *Xorilbia* spp.

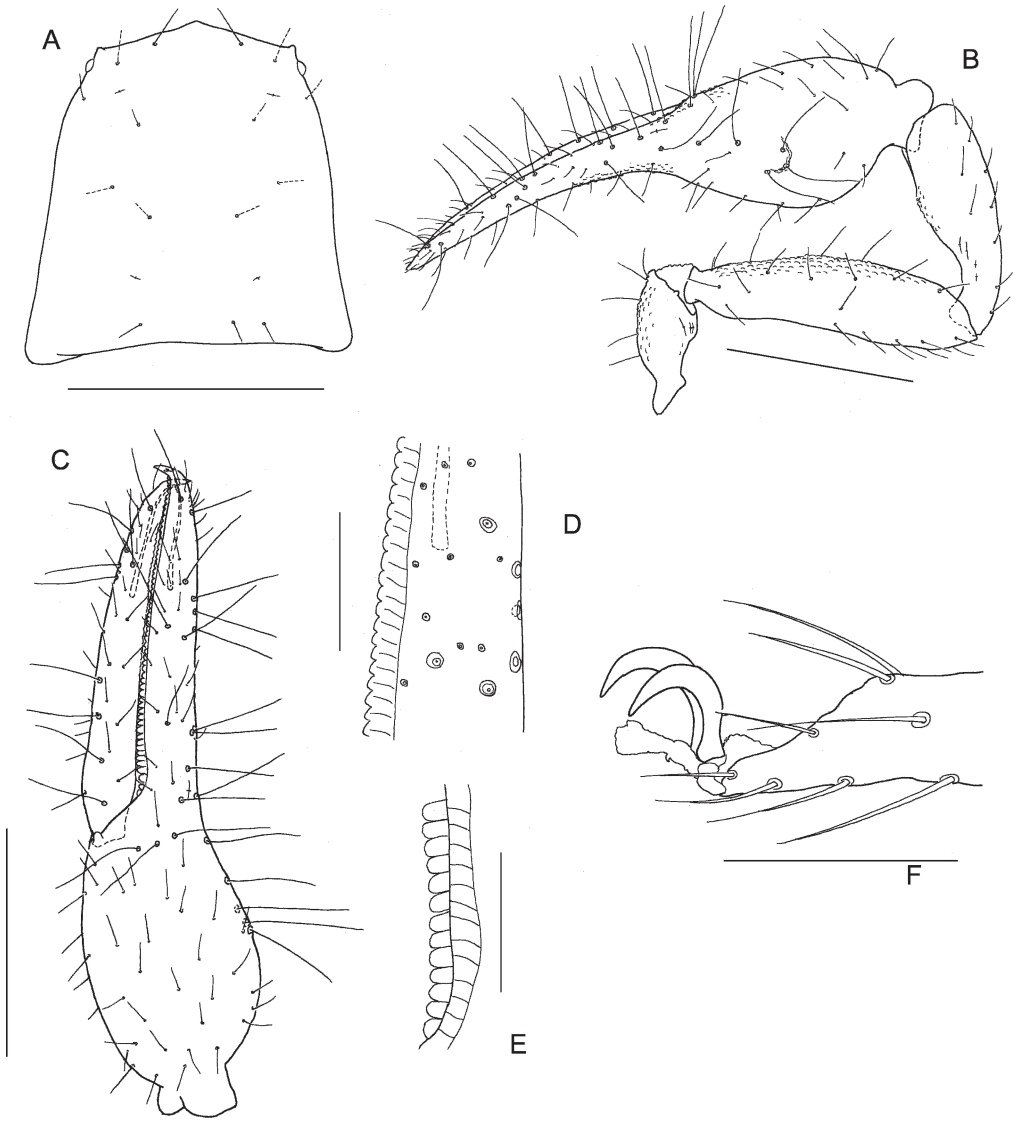

Figure 27.—*Mahnertius hadrodentatus* Harvey & Muchmore sp. nov., female holotype: A. Carapace, dorsal; B. Right pedipalp, dorsal; C. Left chela, lateral; D. fixed chelal finger, lateral; E. fixed chelal finger, basal region, lateral; F. Tip of right tarsus IV. Scale lines = 0.5 mm (A–C); 0.1 mm (D–F).

Genus ***Mahnertius*** Harvey & Muchmore gen. nov.

Type species.—*Mahnertius stipodentatus* Harvey & Muchmore sp. nov.

Diagnosis.—*Mahnertius* differs from all other ideoroncid genera in having the distal teeth of the fixed chelal finger compressed and enlarged (Figs. 28G, 28H). *Mahnertius* resembles species of *Xorilbia* and *Typhloroncus* in having arolia that are shorter than the claws (Figs. 27F, 28D) and that have a ventral hooked process, but the anal operculum does not closely abut sternite X as in *Typhloroncus*, and the arolia are not divided as in *Xorilbia*.

Description.—*Adult:* setae: long, straight and acicular.

Chelicera (Fig. 28B): hand with 6 setae; movable finger with 1 long subdistal seta; rallum of 4 thickened blades, all blades serrate (Fig. 28A); lamina exterior absent; galea long and slender.

Pedipalp (Figs. 27B, 28C): long and slender. Patella with disto-prolateral excavation. Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria: *eb* region with 1 trichobothrium; *est* region with 6 trichobothria; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *b* region with 2 trichobothria; *sb* and *st* regions with 1 trichobothrium; and *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *st* not ventrally displaced (Figs. 27C, 28E). Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near *t* region in movable finger. Chelal teeth small and evenly spaced; distal teeth of the fixed chelal finger compressed and enlarged (Figs. 28G, 28H); base of fixed chelal finger with several small denticles. Chelal hand with retrolateral condyle small and rounded.

Carapace (Fig. 27A): with 2 small bulging eyes; without furrows; anterior margin with 4 setae.

Coxal region: manducatory process with 2 long distal setae. Median maxillary lyrifissure present and sub-basally situated.

Legs: femur I and II without basal swelling; femora I and II with primary slit sensillum directed transversely; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; metatarsal pseudotactile seta sub-proximal; legs with subterminal tarsal setae with small ventral denticulation; arolium shorter than claws, not divided, with ventral hooked protuberance; without sub-ungual spine; claws slender and simple (Figs. 27F, 28D).

Abdomen: tergites and sternites undivided. Pleural membrane longitudinally striate. Each stigmatic sclerite with 1 seta; spiracles simple, with spiracular helix. Anterior margin of anal operculum not abutting posterior margin of sternite X.

Genitalia: male median genital sac not visible in material examined; female with large gonosac covered with scattered pores.

Nymphs: Unknown.

Remarks.—This genus is quite distinct from other ideoroncids, and readily recognized by the morphology of the distal teeth of the fixed chelal finger. It is known only from Colombia (Figs. 2B, 26C).

Etymology.—This genus is named for Volker Mahnert, the former Director of the Muséum d'histoire naturelle de la Ville de Genève, and internationally renowned pseudoscorpion authority in honor of his contributions to arachnology.

KEY TO SPECIES OF *MAHNERTIUS*

1. Basal teeth of fixed chelal finger enlarged (Fig. 27E) . . . . . *M. hadrodentatus*
   Basal teeth of fixed chelal finger not enlarged (Fig. 28E) . . . . . *M. stipodentatus*

Mahnertius hadrodentatus Harvey & Muchmore sp. nov.
Figs. 26C, 27

Material examined.—*Holotype.* COLOMBIA: *Departamento de Cundinamarca*: female, Finca Bella Vista, near Sasaima (4°54′N, 74°26′W), 4 June 1965, under plant cover in root-soil leaf mold (duff), P.R. Craig (CAS).

Diagnosis.—*Mahnertius hadrodentatus* differs from *M. stipodentatus* by having enlarged basal teeth of the fixed chelal finger (Fig. 27E).

Description.—*Adult:* Color: pedipalps, carapace and coxae deep yellow-brown; appendages and abdominal segments yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 submedial seta; galea very slender and elongate; fixed finger with 10 (female) teeth; movable finger with 7 (female) teeth; rallum of 4 long blades, each with (basal to distal) 5, 9, 10 and 13 serrations; lamina exterior absent.

Pedipalp (Fig. 27B): trochanter with granules on prolateral face; femur with large granules on prolateral face; patella with fine granules on prolateral face; chela with very small denticles on prolateral face at base of fingers, on retrolateral face at base of fingers; basal half movable finger with granules on retrolateral face; trochanter 2.37 (female), femur 3.91 (female), patella 2.97 (female), chela (with pedicel) 3.88 (female), chela (without pedicel) 3.70 (female), hand 1.44 (female) x longer than broad, movable finger 1.55 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 27C): *eb*, *esb* and *isb* in straight row at base of finger; *eb* region with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger. Chelal teeth generally small and juxtadentate (Fig. 27D): fixed finger with 63 (female) teeth, including the 9 distal-most teeth raised into crest, and the basal teeth enlarged (Fig. 27E); movable finger with ca. 16 (female) low teeth, followed by smaller raised mounds; base of fixed chelal finger with several small denticles.

Carapace (Fig. 27A): lateral margins evenly convex; 1.11 × longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with 15 setae including 4 on anterior margin and 4 on posterior margin; without furrows.

Coxal region: manducatory process somewhat pointed, with 2 apical acuminate setae; chaetotaxy 2 + 5: 4: 4: 5: 6 (female).

Legs: femur + patella 2.97 (female) x longer than deep; subterminal tarsal setae with small ventral denticulation; arolium shorter than claws, not divided, with ventral hooked process (Fig. 27F).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: female, 4: 4: 7: 10: 11: 11: 11: 12: 13: 11: 7 (including 4 tactile setae): 2. Sternal chaetotaxy: female, 6: (1) 4 (1): (1) 6 (1): 11: 13: 12: 11: 14: 11: 7 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: female with large gonosac which is covered with scattered pores.

Dimensions (mm): Female holotype: Body length ca. 2.4. Pedipalp: trochanter 0.425/0.179, femur 0.911/0.233, patella 0.698/0.235, chela (with pedicel) 1.670/0.430, chela (without pedicel) 1.590, hand (without pedicel) length 0.620, movable finger length 0.962. Chelicera 0.428/0.207, movable finger length 0.240. Carapace 0.740/0.666; eye diameter 0.045. Leg I: femur 0.485/0.121, patella 0.286/0.110, tibia 0.318/0.080, metatarsus 0.186/0.069, tarsus 0.317/0.052. Leg IV: femur + patella 0.760/0.256, tibia 0.533/0.118, metatarsus 0.266/0.095, tarsus 0.441/0.065.

Remarks.—*Mahnertius hadrodentatus* occurs in central Colombia (Fig. 26C).

Etymology.—The specific epithet refers to the large basal teeth of the fixed chelal finger, *hadros*, Greek, well-developed, bulky, and *dentatus*, Latin, toothed, pointed (Brown 1956).

Mahnertius stipodentatus Harvey & Muchmore sp. nov.
Figs. 25C, 28

Material examined.—*Holotype.* COLOMBIA: *Departamento del Magdalena*: male, San Pedro–San Javier, S.N. de Santa Marta (10°18′N, 74°14′W), 5,130 feet [= 1,563 m], 29 March 1975, leaf litter under rock, J.A. Kochalka (FSCA, WM4847.01001).

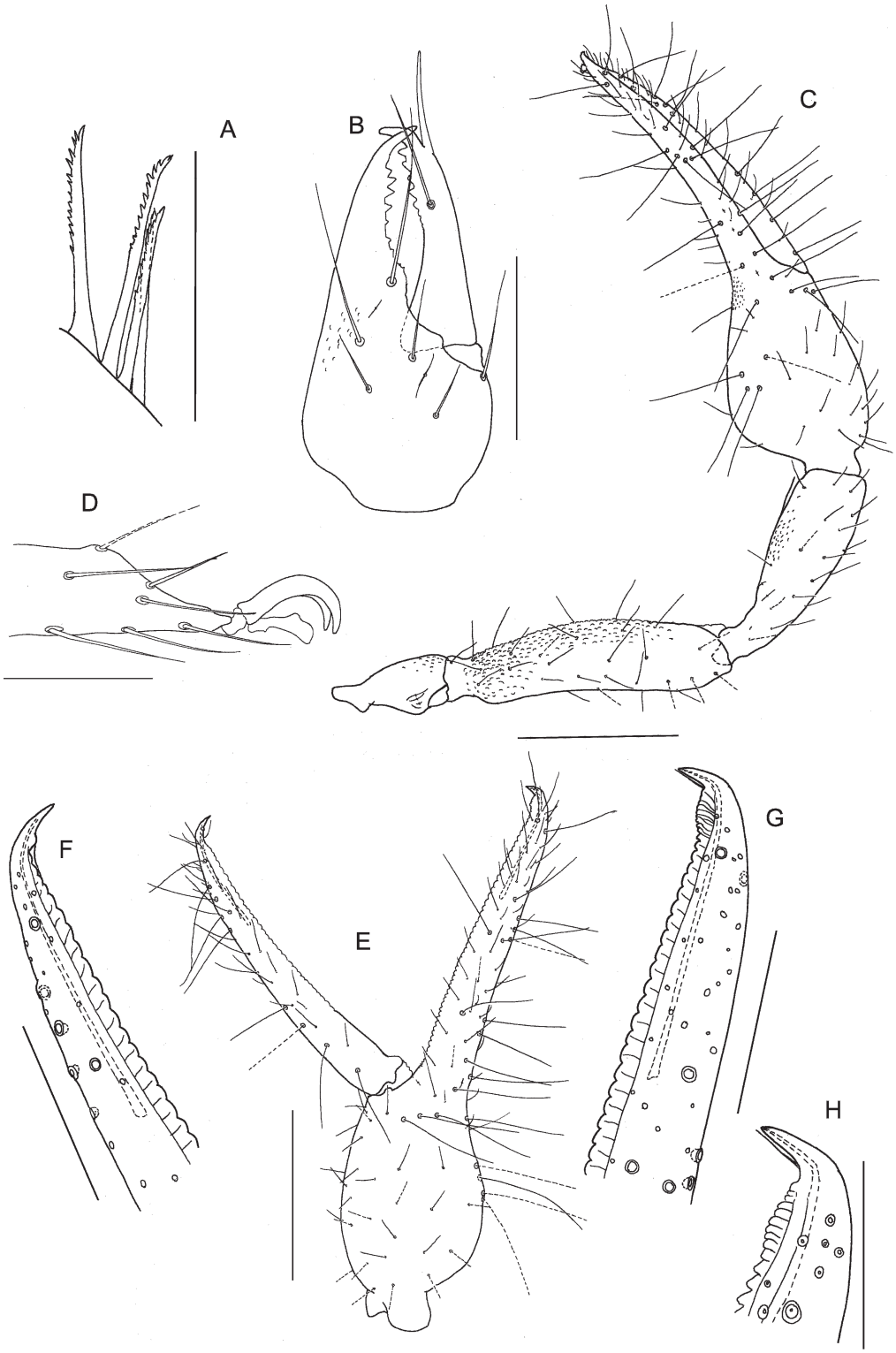

Figure 28.—*Mahnertius stipodentatus* Harvey & Muchmore sp. nov., male holotype: A. Left rallum; B. Right chelicera; C. Right pedipalp, dorsal; D. Tip of left tarsus IV; E. Left chela, lateral; F. movable chelal finger, lateral; G. fixed chelal finger, lateral; H. Tip of fixed chelal finger, lateral. Scale lines = 0.5 mm (C, E); 0.2 mm (B, F, G); 0.1 mm (A, D, H).

Paratype. COLOMBIA: *Departamento del Magdalena*: 1 female, collected with holotype (FSCA, WM4847.01002).

Diagnosis.—*Mahnertius stipodentatus* differs from *M. hadrodentatus* by not having the enlarged basal teeth of the fixed chelal finger (Fig. 28E) found in *M. hadrodentatus*.

Description.—*Adult:* Color: pedipalps, carapace and coxae deep yellow-brown; appendages and abdominal segments yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 submedial seta; galea very slender and elongate; fixed finger with 10 (male, female) teeth; movable finger with 7 (male, female) teeth; rallum of 4 long blades, each with 9–11 small serrations; lamina exterior absent.

Pedipalp (Fig. 28C): trochanter with granules on prolateral face; femur with large granules on prolateral face and basal half; patella with fine granules on prolateral face; chela with very small denticles on prolateral face at base of fingers; trochanter 2.45 (male), 2.52 (female), femur 4.06 (male), 3.96 (female), patella 3.17 (male), 2.83 (female), chela (with pedicel) 3.72 (male), 3.78 (female), chela (without pedicel) 3.54 (male), 3.58 (female), hand 1.32 (male), 1.40 (female) x longer than broad, movable finger 1.69 (male), 1.50 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 28E): *eb*, *esb* and *isb* in straight row at base of finger; *eb* region with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger. Chelal teeth generally small and juxtadentate: fixed finger with 58 (male), 59 (female) teeth, including the 8–9 distal-most teeth raised into crest (Figs. 28G, 28H); movable finger with 34 (male), 38 (female) low teeth (Fig. 28F); base of fixed chelal finger with several small denticles.

Carapace: lateral margins evenly convex; ? (damaged) x longer than broad; with 2 small bulging eyes; anterior margin medially prominent; with 18 setae including 4 on anterior margin and 4 on posterior margin; without furrows.

Coxal region: manducatory process somewhat pointed, with 2 apical acuminate setae; chaetotaxy 2 + 4: 4: 5: 3: 7 (♂); 2 + 4: 3: 5: 5: 5 (female).

Legs: femur + patella 2.67 (male), 3.00 (female) x longer than deep; subterminal tarsal setae with small ventral denticulation; arolium shorter than claws, not divided, with ventral hooked process (Fig. 28D).

Abdomen: tergites and sternites undivided and uniseriate. Tergal chaetotaxy: male, 4: 4: 6: 7: 9: 11: 12: 13: 12: 15: 12: 2; female, 4: 4: 4: 7: 9: 10: 11: 11: 13: 10 (including 2 tactile setae): 7 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 7: (1) 12 [3 + 3] (1): (1) 6 (1): 11: 10: 12: 14: 15: 13: 5 (including 4 tactile setae): 2; female, 6: (1) 4 (1): (1) 6 (1): 10: 9: 13: 13: 13: 12: 7 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate.

Genitalia: male with small dorsal apodeme; median genital sac not visible in material examined; female with large gonosac which is covered with scattered pores.

Dimensions (mm): Male holotype: Body length ca. 2.6. Pedipalp: trochanter 0.427/0.174, femur 0.898/0.221, patella 0.732/0.231, chela (with pedicel) 1.597/0.429, chela (without pedicel) 1.520, hand (without pedicel) length 0.568, movable finger length 0.958. Chelicera 0.414/0.201, movable finger length 0.243. Carapace ca. 0.68/? (crushed); eye diameter 0.048. Leg I: femur 0.467/0.122, patella 0.274/0.118, tibia 0.326/0.083, metatarsus 0.190/0.069, tarsus 0.321/0.058. Leg IV: femur + patella 0.768/0.288, tibia 0.539/0.128, metatarsus 0.282/0.103, tarsus 0.458/0.074.

Female paratype: Body length ca. 3.1. Pedipalp: trochanter 0.453/0.180, femur 0.914/0.231, patella 0.674/0.238, chela (with pedicel) 1.698/0.449, chela (without pedicel) 1.608, hand (without pedicel) length 0.630, movable finger length 0.947. Chelicera 0.458/0.219, movable finger length 0.277. Carapace ca. 0.67/? (crushed); eye diameter 0.051. Leg I: femur 0.484/0.127, patella 0.283/0.120, tibia 0.192/0.085, metatarsus 0.186/0.073, tarsus 0.307/0.058. Leg IV: femur + patella 0.789/0.263, tibia 0.594/0.123, metatarsus 0.291/0.106, tarsus 0.446/0.076.

Remarks.—*Mahnertius stipodentatus* occurs in northern Colombia (Fig. 26C).

Etymology.—The specific epithet refers to the compressed distal teeth of the fixed chelal finger, *stipo*, Latin, press, cram, crowd, and *dentatus*, Latin, toothed, pointed (Brown 1956).

Genus ***Muchmoreus*** Harvey gen. nov.

Type species.—*Muchmoreus ignotus* Harvey & Muchmore sp. nov.

Diagnosis.—*Muchmoreus* differs from all other ideoroncid genera by the position of trichobothrium *eb* which is situated slightly distal of *esb* (Fig. 29D), rather than on the same level as *esb*, and have 2 or 3 setae on the spiracular plates, whereas most other genera with the exception of *Pseudalbiorix* have a single seta. *Muchmoreus* resembles *Ideoroncus*, *Dhanus*, *Nhatrangia* and *Shravana* in having long, undivided arolia which lack a ventral hook (Fig. 29I). However, *Muchmoreus* lacks the medial suture line on the median sternites found in *Ideoroncus*, and lacks the cheliceral lamina exterior found in *Dhanus*, *Nhatrangia* and *Shravana*.

Description.—*Adult:* setae: long, straight and acicular.

Chelicera (Fig. 29B): hand with 6 or 7 setae; movable finger with 1 long subdistal seta; rallum of 4 thickened blades, all blades serrate; lamina exterior absent; galea long and slender.

Pedipalp (Fig. 29C): long and slender. Patella with large disto-prolateral excavation. Fixed chelal finger and hand with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 29D): *eb* region with 1 trichobothrium; *eb* distal of *esb*; *est* region with 6 trichobothria; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *b* region with 2 trichobothria; *sb* and *st* regions with 1 trichobothrium; and *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *st* not ventrally displaced. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near *t* region in movable finger. Chelal teeth small and evenly spaced; base of fixed chelal finger with several small denticles. Chelal hand with retrolateral condyle small and rounded.

Carapace (Fig. 29A): with 2 large, bulging eyes; without furrows; anterior margin with 4 setae.

Coxal region: manducatory process with 2 long distal setae. Median maxillary lyrifissure present and sub-basally situated.

Legs: femur I and II without basal swelling; femora I and II with primary slit sensillum directed transversely; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; metatarsal pseudotactile seta sub-proximal; legs with trifurcate subterminal tarsal setae; arolium slightly longer than claws, not divided, without ventral hooked protuberance; without subungual spine; claws slender and simple (Fig. 29I).

Abdomen: tergites and sternites undivided. Pleural membrane longitudinally striate. Each stigmatic sclerite with 2 or 3 setae; spiracles simple, with spiracular helix. Anterior margin of anal operculum not abutting posterior margin of sternite X.

Genitalia: male median genital sac not visible in material examined; female with large gonosac covered with scattered pores.

Tritonymph. Fixed finger with 14 trichobothria, movable finger with 8 trichobothria (Fig. 29H); *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 1 trichobothrium; *t* region with 5 trichobothria; all other regions represented by 1 trichobothrium.

Remarks.—*Muchmoreus* is known only from the type species *M. ignotus* from Mexico (Figs. 2A, 26C).

Etymology.—This genus is dedicated to co-author William B. Muchmore in recognition of his contributions to systematic arachnology over a 40 year career. The name is to be treated as masculine.

Muchmoreus ignotus Harvey & Muchmore sp. nov.
Figs. 26C, 29

Material examined.—*Holotype*. MEXICO: *Yucatan*: male, 1 km S. of Muna (20°28′N, 89°43′W), 31 July –4 August 1973, J. Reddell (FSCA, WM3406.03001).

Paratypes. MEXICO: *Yucatan*: 3 female, same data as holotype (FSCA, WM3406.03002–4); 1 female, same data as holotype (WAM T129659, WM3406.03005); 1 male, Chichén Itzá (20°40′N, 88°34′W), under rocks, 8 August 1973, J. Reddell (FSCA, WM3402.02001); 1 male, same data (WAM T129660, WM3402.02002); 1 female, 3 km S. of Calcehtok (20°32′N, 89°54′W), under rocks, 3 August 1973, J. Reddell (FSCA, WM3404.01001); 1 male, 1 tritonymph, Tixkokob (21°00′N, 89°24′W), under rocks, 12 August 1973, J. Reddell (FSCA, WM3405.02001–2).

Other material. MEXICO: *Campeche*: 1 male, 2 km W. of Hopelchén (19°45′N, 89°52′W), 23 August 1972, Cooke, Russell, Mitchell (FSCA, WM3503.01001).

Diagnosis.—As for genus.

Description.—*Adult:* Color: pedipalps red-brown; carapace light red-brown; legs and abdomen pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera (Fig. 29B): hand with 6 setae, although the left chelicera of one female specimen bears 7 setae; movable finger with 1 subdistal seta; galea very slender and elongate; fixed finger with ca. 7 (male), 5 (female) small teeth; movable finger with ca. 4 (male), 5 (female) very small teeth; rallum of 4 blades, each with several small serrations; lamina exterior absent.

Pedipalp (Fig. 29C): femur and patella slightly rugose on interior face; trochanter 2.11–2.33 (male), 2.23–2.34 (female), femur 3.91–4.36 (male), 3.88–4.26 (female), patella 2.67–3.07 (male), 2.75–2.92 (female), chela (with pedicel) 3.72–4.08 (male), 3.46–3.84 (female), chela (without pedicel) 3.64–3.92 (male), 3.31–3.74 (female), hand (without pedicel) 1.36–1.56 (male), 1.35–1.48 (female) x longer than broad, movable finger 1.55–1.64 (male), 1.47–1.52 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 20 trichobothria, movable chelal finger with 10 trichobothria (Fig. 29D): *eb*, *esb* and *isb* at base of finger, *eb* situated slightly distal of *esb*; *eb* region with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 5 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near basal section of *t* region in movable finger. Chelal hand with retrolateral condyle small and rounded. Chelal teeth small, evenly spaced, conical and slightly retrorse, movable finger with 2 enlarged teeth at distal end; fixed finger with ca. 46–56 (male), 42–52 (female) teeth; movable finger with ca. 36–39 (male), 33–37 (female) teeth; base of fixed chelal finger with several small denticles.

Carapace (Fig. 29A): lateral margins evenly convex; 1.11–1.45 (male), 1.13–1.36 (female) x longer than broad; with 2 large, bulging eyes; anterior margin medially prominent; with 20–22 (male), 20–21 (female) setae including 4 setae on anterior margin and 4, occasionally 5 or 6, on posterior margin; without furrows.

Coxal region: manducatory process somewhat pointed, with 2 apical acuminate setae; chaetotaxy 2 + 6: 4: 5–6: 6: 7–8 (male); 2 + 7: 4: 5–6: 6: 6–9 (female).

Legs: femur + patella 2.17–2.34 (male), 2.31–2.47 (female) x longer than deep; subterminal tarsal setae trifurcate; arolium slightly longer than claws, not divided, without ventral hooked process.

Abdomen: tergites and sternites not divided and uniseriate. Tergal chaetotaxy: male, 4: 4–7: 6–9: 8–9: 8–9: 7–9: 8–10: 8–10: 9–10: 7–10: 6: 2; female, 4–5: 4–6: 8–9: 8–9: 8–10: 8–9: 8–11: 8–10: 9–10: 8–10: 4–7: 2. Sternal chaetotaxy: male, 13–16: (2–3) 13–18 [3 + 3] (2–3): (2) 6–8 (2): 10–13: 10–12: 11–12: 11–12: 11: 10–12: 8: 2; female, 8–11: (2–3) 4–7 (2–3): (2–3) 6–7 (2–3): 10–13: 11–12: 11–13: 11–13: 11: 11–13: 8: 2. Setae of female sternite II reduced in size, but not minute, ca. 9–10 μm in length; setae of tergites and sternites IX–XI acuminate; with several tactile setae.

Genitalia: male with small dorsal apodeme; median genital sac not visible in material examined; female with large gonosac, which is covered with scattered pores.

Dimensions (mm): Male: holotype followed by other males (where applicable): Body length 2.58 (2.39–2.68). Pedipalp: trochanter 0.39/0.175 (0.38–0.40/0.165–0.19), femur 0.86/0.22 (0.85–0.87/0.195–0.21), patella 0.665/0.23 (0.64–0.66/0.215–0.24), chela (with pedicel) 1.45/0.39 (1.41–1.57/0.36–0.40), chela (without pedicel) length 1.42 (1.36–1.55), hand (without pedicel) length 0.53 (0.54–0.59), movable finger length 0.87 (0.835–0.910). Chelicera 0.32–0.155; movable finger length 0.19. Carapace 0.84/0.58 (0.80–0.84/0.63–0.72); eye diameter 0.065. Leg I: femur 0.41/0.105, patella 0.20/0.095, tibia 0.29/0.075, metatarsus 0.20/0.06, tarsus 0.28/0.05. Leg IV: femur + patella 0.72/0.325 (0.69–0.76/0.31–0.35, tibia 0.47/0.12, metatarsus 0.25/0.09, tarsus 0.35/0.06.

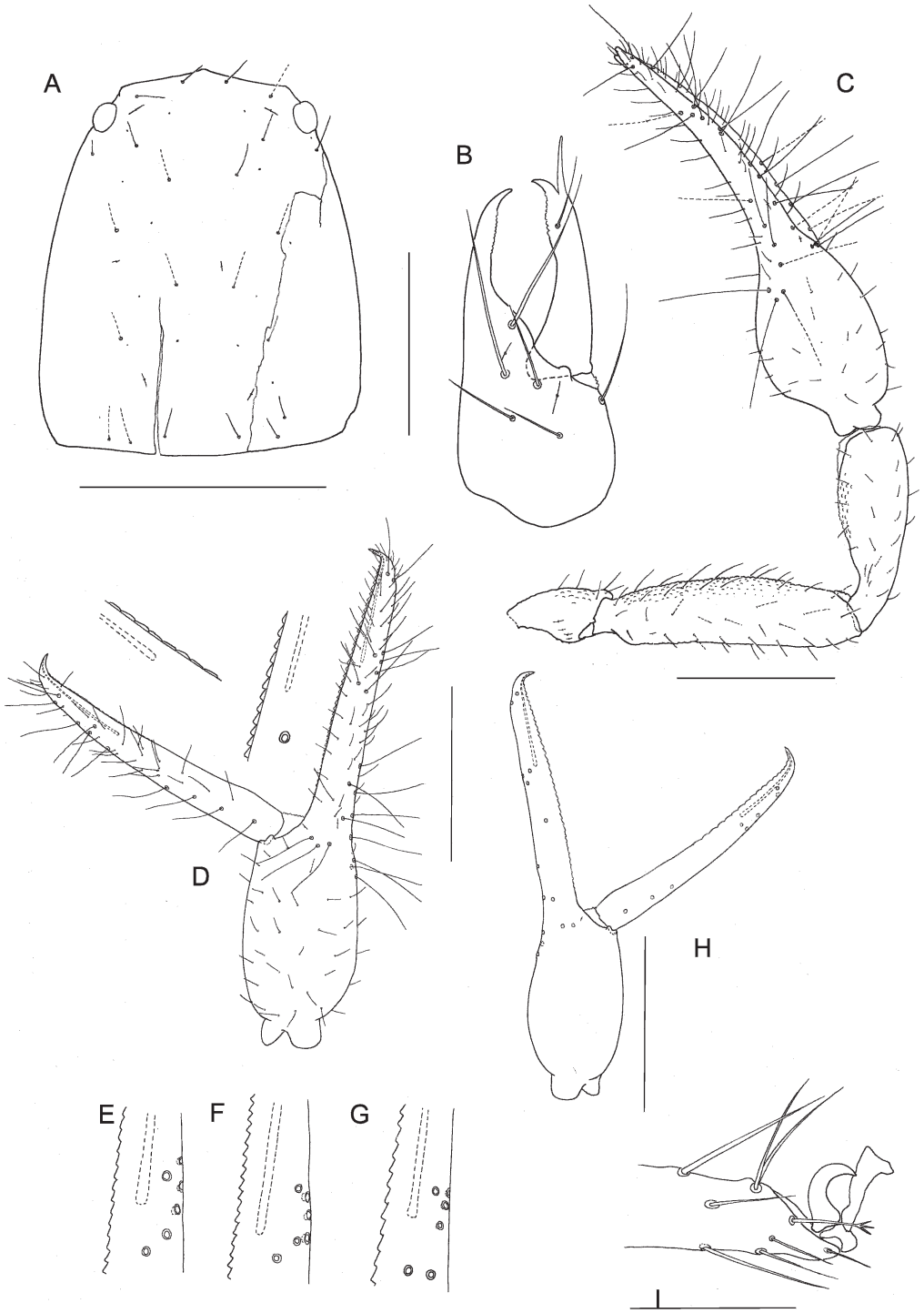

Figure 29.—*Muchmoreus ignotus* Harvey & Muchmore sp. nov., male holotype, unless stated otherwise: A. Carapace; B. Left chelicera, dorsal; C. Right pedipalp, dorsal; D. Left chela, lateral; E–G, teeth of the fixed chelal finger, showing variation in trichobothrial position: E (FSCA, WM 3405.02001), F (FSCA, WM 3402.02002), G (FSCA, WM 3402.02001); H. Right chela, setae omitted, lateral, tritonymph paratype (FSCA, WM 3405.02002); I. Tip of right tarsus IV. Scale lines = 0.5 mm (A, C, D, H); 0.2 mm (B); 0.1 mm (I).

Female (WM3406.03002), followed by other females (where applicable): Body length 3.00 (2.82–3.07). Pedipalp: trochanter 0.43/0.19 (0.445/0.19–0.20), femur 1.00/0.235 (0.96–0.97/0.235–0.25), patella 0.73/0.25 (0.70–0.74/0.245–0.26), chela (with pedicel) 1.71/0.445 (1.62–1.67/0.435–0.48), chela (without pedicel) length 1.665 (1.590–1.61), hand (without pedicel) length 0.66 (0.635–0.66), movable finger length 0.985 (0.95–0.97). Chelicera 0.38/0.17; movable finger length 0.22. Carapace 0.895/0.67 (0.850–0.925/0.680–0.815); eye diameter 0.064. Leg I: femur 0.465/0.125, patella 0.23/0.115, tibia 0.32/0.085, metatarsus 0.22/0.065, tarsus 0.31/0.05. Leg IV: femur + patella 0.805/0.34 (0.76–0.815/0.31–0.34, tibia 0.525/0.125, metatarsus 0.295/0.095, tarsus 0.39/0.065.

Tritonymph: Chelicera: galea long, nearly straight; hand with 5 setae, movable finger with 1 seta; fixed finger with 6 small teeth, movable finger with 5 small teeth; rallum composed of 4 blades, all serrate.

Pedipalp: trochanter 2.10, femur 3.89, patella 2.70, chela (with pedicel) 4.10, chela (without pedicel) 4.02 × longer than broad. Fixed finger with 14 trichobothria, movable finger with 8 trichobothria (Fig. 29H); *eb* region with 1 trichobothrium; *ib* region with 3 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 1 trichobothrium; *t* region with 5 trichobothria.

Carapace: 1.15 × longer than broad; anterior margin medially prominent; 1 pair of small eyes present; with 4 setae on anterior margin and 4 setae on posterior margin.

Legs: mostly as in adult.

Dimensions (mm): Body length 2.37. Pedipalp: trochanter 0.325/0.155, femur 0.70/0.18, patella 0.50/0.185, chela (with pedicel) 1.23/0.30, chela (without pedicel) 1.205, hand (without pedicel) length 0.46, movable finger length 0.74. Carapace 0.70/0.61.

Remarks.—*Muchmoreus ignotus* has been found under rocks in a variety of Mexican localities in Yucatan and in neighboring Campeche (Fig. 26C).

Etymology.—The Latin specific epithet *ignotus* (unknown, strange) refers to the necessity for us to erect a new genus to accommodate this species.

Genus *Pseudalbiorix* Harvey, Barba, Muchmore and Peréz 2007

Pseudalbiorix Harvey, Barba, Muchmore and Peréz 2007:611; Harvey 2013:unpaginated.

Type species.—*Albiorix reddelli* Muchmore 1982b, by original designation.

Diagnosis.—*Pseudalbiorix* differs from all other ideoroncids by the enlarged, bifurcate retrolateral chelal condyle (Harvey et al. 2007).

Description.—*Adult:* See Harvey et al. (2007). In addition: base of fixed chelal finger without small denticles.

Nymphs: See Harvey et al. (2007).

Remarks.—The four species of *Pseudalbiorix* are found in Central America and western Cuba (Harvey et al. 2007) (Figs. 2B, 26D).

KEY TO SPECIES OF *PSEUDALBIORIX* (FROM HARVEY ET AL. 2007)

1. Most teeth of fixed chelal finger long and erect, clearly longer than wide 2
   Most teeth of fixed chelal finger of medium length and retrorse, clearly wider than long 3
2. Large troglomorphic species, e.g., pedipalpal femur 1.26–1.39 mm in length; chela (without pedicel) 2.10–2.24 mm in length . . . . . *P. muchmorei*
   Medium-sized epigean species, e.g., pedipalpal femur 0.68–1.03 mm in length; chela (without pedicel) 1.14–1.68 mm in length. . . . . *P. armasi*
3. Slightly larger in size, e.g., chela (with pedicel) length greater than 1.20 mm; most teeth of fixed chelal finger triangular . . . *P. reddelli*
   Slightly smaller in size, e.g., chela (with pedicel) length less than 1.20 mm; most teeth of fixed chelal finger arcuate . . . . *P. veracruzensis*

Pseudalbiorix armasi Barba and Pérez 2007
Fig. 26D

Pseudalbiorix armasi Barba and Pérez, in Harvey, Barba, Muchmore and Pérez 2007:623–625, Figs. 2, 33–37; Harvey 2013:unpaginated.

Material examined.—See Harvey et al. (2007), as well as: CUBA: *Pinar del Rio:* 1 male, Los Banos de San Vincente (22°40′N, 83°43′W), 1 August (no year stated), Parsons (MCZ, Hoff slide S–3299).

Diagnosis.—Like *P. muchmorei*, this species has large, erect chelal teeth, but differs by being smaller, e.g., pedipalpal femur 0.68–1.03 mm in length, and chela (without pedicel) 1.14–1.68 mm in length.

Description.—*Adult:* See Harvey et al. (2007).

Nymphs: See Harvey et al. (2007).

Remarks.—*Pseudalbiorix armasi* is known only from Pinar del Río Province, Cuba (Fig. 26D).

Pseudalbiorix muchmorei Barba and Pérez 2007
Fig. 26D

Pseudalbiorix muchmorei Barba and Pérez, in Harvey, Barba, Muchmore and Pérez 2007:621–623, Figs. 3, 28–32; Harvey 2013:unpaginated.

Material examined.—See Harvey et al. (2007).

Diagnosis.—Like *P. armasi*, this species has large, erect chelal teeth, but differs by being larger, e.g., pedipalpal femur 1.26–1.39 mm in length, and chela (without pedicel) 2.10–2.24 mm in length.

Description.—*Adult:* See Harvey et al. (2007).

Remarks.—*Pseudalbiorix muchmorei* is known only from caves situated in Pinar del Río Province, Cuba (Fig. 26D).

Pseudalbiorix reddelli (Muchmore 1982)
Fig. 26D

Albiorix reddelli Muchmore 1982b:77, Figs. 37–40; Mahnert 1984a:676–677, Fig. 47 [as *Albiorix* (?) *reddeli* (sic)]; Harvey 1991:318; Ceballos 2004:428.

Pseudalbiorix reddelli (Muchmore): Harvey et al. 2007:613–618, Figs. 1, 2, 8–22; Harvey & Volschenk 2007:368, Figs. 1–4; Harvey 2013:unpaginated.

Material examined.—See Harvey et al. (2007).

Diagnosis.—Like *P. veracruzensis*, this species has medium length chelal teeth, but differs by being slightly larger, e.g. chela (with pedicel) length greater than 1.20 mm, and most teeth of fixed chelal finger triangular.

Description.—*Adult:* See Harvey et al. (2007).

Nymphs: See Harvey et al. (2007).

Remarks.—This species was originally described from specimens collected within Grutas de Monteflor, Oaxaca, Mexico (Muchmore 1982b) and was redescribed from numerous specimens by Harvey et al. (2007). It is only known from southern Mexico (Fig. 26D).

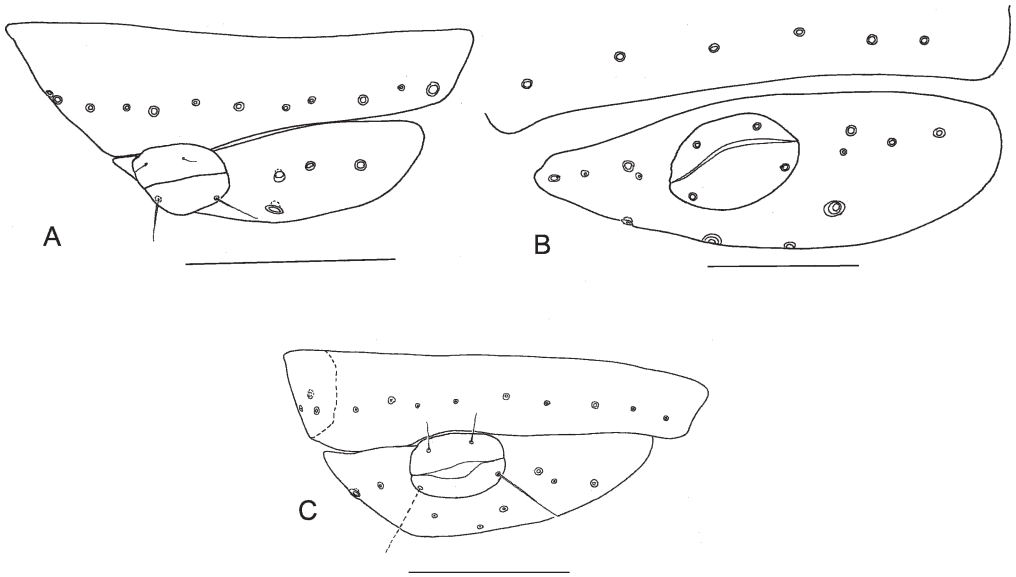

Figure 30.—*Typhloroncus* spp., anal region, ventral: A. *T. coralensis* Muchmore (distorted during slide preparation), male (FSCA, WM6566.02001); B. *T. xilitlensis* Muchmore, male holotype (FSCA, WM6104.01001); C. Anal region, ventral. Scale lines = 0.2 mm.

Pseudalbiorix veracruzensis (Hoff 1945)
Figs. 1A, 1B, 26D

Albiorix veracruzensis Hoff 1945:4–7, figs 6–9; Harvey 1991:318; Ceballos 2004:428.

Pseudalbiorix veracruzensis (Hoff): Harvey et al. 2007:619–621, Figs. 3, 8, 23–27; Murienne et al. 2008:174; Harvey 2013:unpaginated.

Material examined.—See Harvey et al. (2007).

Diagnosis.—Like *P. reddelli*, this species has medium length chelal teeth, but differs by being slightly smaller, e.g., chela (with pedicel) length less than 1.20 mm, and most teeth of fixed chelal finger arcuate.

Description.—*Adult:* See Harvey et al. (2007).

Nymphs: See Harvey et al. (2007).

Remarks.—Originally described in the genus *Albiorix*, this species was transferred to the genus *Pseudalbiorix* by Harvey et al. (2007). It is known from various locations in Belize, Guatemala and southern Mexico (Fig. 26D).

Genus *Typhloroncus* Muchmore 1979

Typhloroncus Muchmore 1979:317–318; Mahnert 1984a:677; Muchmore 1986:27–28; Harvey 1991:322; Harvey 2013:unpaginated.

Type species.—*Typhloroncus coralensis* Muchmore 1979, by original designation.

Diagnosis.—*Typhloroncus* can be distinguished from all other ideoroncid genera by the position of the anal operculum which either abuts sternite X or is situated very close to it (Figs. 30A–C).

Description.—*Adult:* setae: long, straight and acicular.

Chelicera: hand with 5 or 6 setae; movable finger with 1 long subdistal seta; rallum of 4 blades, all blades serrate; lamina exterior absent; galea long and slender.

Pedipalp (Fig. 31C): long and slender. Patella with distoprolateral excavation. Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 31E): *eb* region with 1 trichobothrium; *est* region with 6 trichobothria; *ib* region with 4 trichobothria; *ist* region with 6 trichobothria; *b* region with 2 trichobothria; *sb* and *st* regions with 1 trichobothrium; and *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus near *est* region in fixed finger and near *t* region in movable finger. Chelal teeth all closely spaced (Figs. 31F, 31G); base of fixed chelal finger with several small denticles. Chelal hand with retrolateral condyle small and rounded.

Carapace: eyes present (Figs. 31A, 31B) or absent; with or without posterior furrow; anterior margin with 4 or occasionally 5 setae.

Coxal region: manducatory process with 2 long distal setae. Median maxillary lyrifissure present and sub-basally situated.

Legs: femur I and II without basal swelling; femora I and II with primary slit sensillum directed transversely; femur I much longer than patella I; suture line between femur IV and patella IV transverse; metatarsus shorter than tarsus; metatarsal pseudotactile seta sub-proximal; legs with subterminal tarsal setae terminally denticulate, acicular or strongly lanceolate; arolium shorter than claws, not divided, with ventral hooked protuberance; without sub-ungual spine; claws slender and simple (Fig. 31D).

Abdomen: tergites and sternites undivided, medial sternites without medial suture line. Pleural membrane longitudinally striate. Each stigmatic sclerite with 1 seta; spiracles simple, with spiracular helix. Anterior margin of anal operculum touching posterior margin of sternite XI (Figs. 30A–C).

Genitalia: male median genital sac bipartite; female with large gonosac covered with scattered pores.

Nymphs: Unknown.

Remarks.—The genus *Typhloroncus* was proposed by Muchmore (1979) for a small blind ideoroncid from the U.S. Virgin Islands and was later extended with the description of

four large troglobites from Mexico (Muchmore 1982b, 1986) (Figs. 2B, 26E). Members of the genus are currently characterised by the lack of eyes, the short, undivided arolium, the number of trichobothria, and the presence of a dorsal eminence on the chelal hand (Muchmore 1982b). Most notably they lack various features diagnostic of other genera, such as the divided arolium in *Albiorix*, the bipartite retrolateral chelal condyle in *Pseudalbiorix*, and the widely spaced teeth of *Xorilbia*. We have found during this study that the anal operculum closely abuts the posterior margin of sternite X in all five named species of *Typhloroncus*, as well as in the new epigean species from Mexico (Figs. 30A–C). The discovery of an eyed species of *Typhloroncus* necessitates a modification of the genus, which we propose can be diagnosed by the juxtaposition of the anal operculum and sternite X. This peculiar morphology is not found in any other ideoroncid genus.

KEY TO SPECIES OF *TYPHLORONCUS*

1. Smaller, epigean species, e.g., pedipalpal femur less than 1 mm in length 2
   Larger, troglobitic species, e.g., pedipalpal femur greater than 2 mm in length 3
2. Eyes present (Figs. 31A, 31B) . . . . . *T. planodentatus*
   Eyes absent . . . . . *T. coralensis*
3. Ventral and subterminal tarsal setae of all legs strongly lanceolate . . . . . *T. attenuatus*
   Ventral and subterminal tarsal setae of legs unmodified 4
4. Pedipalpal segments slender, e.g., femur of female 4.5 × longer than broad; chela (without pedicel) of female 4.5 × longer than broad . . . . . *T. diabolus*
   Pedipalpal segments very slender, e.g., femur of female greater than 7.0 × longer than broad; chela (without pedicel) of female greater than 5.5 × longer than broad 5
5. Pedipalpal femur of female 2.03 mm long and 7.25 × longer than broad; chela (without pedicel) of female 3.11 mm long and 5.9 × longer than broad . . . . . *T. troglobius*
   Pedipalpal femur of female 2.37 mm long and 7.65 × longer than broad; chela (without pedicel) of female 3.77 mm long and 6.85 × longer than broad . . . . . *T. xilitlensis*

Typhloroncus attenuatus Muchmore 1982
Fig. 26E

Typhloroncus attenuatus Muchmore 1982b:73–75, Figs. 30–32; Mahnert 1984a:677–678, Fig. 50; Muchmore 1986:28; Harvey 1991:322; Ceballos 2004:428; Villegas-Guzmán 2009:64–66, Figs. 1–7; Harvey 2013:unpaginated.

Material examined.—*Holotype.* MEXICO: *Tamaulipas*: female, Cueva del Brinco, near Conrado Castillo, about 40 km NW. of Ciudad Victoria (23°29′N, 99°19′W), April 1978, A. Grubbs, D. Pate, P. Sprouse, T. Treacy, S. Balsdon, R. Hemperly, P. Strickland (FSCA, WM5465.01001).

Diagnosis.—*Typhloroncus attenuatus* is a large blind troglobite that differs from all other species of the genus by the strongly lanceolate subterminal and ventral tarsal setae of all legs.

Description.—*Adult:* See Muchmore (1982b, 1986) and Villegas-Guzmán & Francke (2009) (but see Remarks below).

Remarks.—The original description was based on a single female from Cueva del Brinco, Tamaulipas, Mexico (Muchmore 1982b), and later augmented by the description of two males from Sistema Cavernario Purificación (Villegas-Guzmán & Francke 2009), which is situated some 60 km to the north of the type locality (Fig. 26E).

Villegas-Guzmán & Francke (2009) claimed that the carapace of their male bore 60 setae but this is likely to be an overestimate, as the holotype only bears 11 setae Muchmore (1982b). The discrepancy has probably arisen by mistaking the many small cuticular pores on the carapace with setal areoles.

Typhloroncus coralensis Muchmore 1979
Fig. 26E

Typhloroncus coralensis Muchmore 1979: 318–319, Figs. 1–5; Muchmore 1982b:71; Mahnert 1984a:677, Fig. 48; Muchmore 1986:28, Fig. 19; Harvey 1991:322; Muchmore 1993:32; Harvey et al. 2007:Fig. 7; Harvey 2013:unpaginated.

Material examined.—US VIRGIN ISLANDS: *Saint John*: 1 male, above Coral Bay, Saint John Island (18°21′N, 64°43′W), 9 May 1984, under rock, W.B. Muchmore (FSCA, WM6566.02001).

Diagnosis.—*Typhloroncus coralensis* is the only epigean species of the genus that completely lacks eyes.

Description.—*Adult male:* Color: pedipalps red-brown; carapace light red-brown; legs and abdomen pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 setae; movable finger with 1 submedial seta; galea very slender and elongate; fixed finger with 16 small teeth; movable finger with 7 small teeth; rallum of 4 blades, each with several serrations; lamina exterior absent.

Pedipalp: Mostly smooth except for most of trochanter, the prolateral faces of the femur, patella and chela, and the retrolateral face of the chelal fingers which are lightly tuberculate; trochanter 2.50, femur 4.24, patella 3.50, chela (with pedicel) 3.88, chela (without pedicel) 3.65, hand 1.49 × longer than broad, movable finger 1.48 × longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria: *eb*, *esb* and *isb* in straight row at base of finger; *eb* region with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus slightly distal to *est* region in fixed finger and within *t* region in movable finger. Chelal teeth: fixed finger with 66 low, juxtadentate teeth; movable finger with ca. 24 low, juxtadentate teeth; base of fixed chelal finger with several small denticles.

Carapace: lateral margins evenly convex; ? x longer than broad (flattened); eyes absent; anterior margin medially prominent; with 18 setae including 4 on anterior margin and 4 on posterior margin; with obvious posterior furrow.

Coxal region: manducatory process somewhat pointed, with 2 apical acuminate setae; chaetotaxy: 2 + 7: 4: 6: 7: 6.

Legs: femur + patella 2.36 × longer than deep; subterminal tarsal setae terminally denticulate; arolium about as long as claws, not divided, with ventral hooked process.

Abdomen: tergites and sternites not divided and uniseriate. Tergal chaetotaxy: 4: 4: 6: 9: 7: 7: 9: 9: 9: 9: 6 (including 4 tactile setae): 2. Sternal chaetotaxy: 8: (1) 9 [3 + 4] (1): (1) 6 (1): 8: 8: 9: 10: 9: 12: 6 (including 4 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate. Anterior margin of anal operculum touching posterior margin of sternite XI.

Genitalia: male median genital sac not visible in material examined.

Dimensions (mm): Body length ca. 2.0. Pedipalp: trochanter 0.351/0.137, femur 0.704/0.166, patella 0.584/0.167, chela (with pedicel) 1.182/0.305, chela (without pedicel) 1.112, hand (without pedicel) length 0.454, movable finger length 0.672. Chelicera 0.321/0.154, movable finger length 0.186. Carapace 0.570/? (flattened). Leg I: femur 0.316/0.086, patella 0.174/0.084, tibia 0.269/0.058, metatarsus 0.122/0.045, tarsus 0.231/0.038. Leg IV: femur + patella 0.487/0.206, tibia 0.372/0.091, metatarsus 0.180/0.059, tarsus 0.282/0.042.

Remarks.—*Typhloroncus coralensis* is found in the US Virgin Islands where it occurs under rocks on wooded hillsides (Muchmore 1979) (Fig. 26E). Mahnert (1984a) and Muchmore (1986) provided illustrations of the chelal trichobothrial pattern. The original description of the adult female is here supplemented with the description of an adult male from the type locality.

Typhloroncus diabolus Muchmore 1982
Fig. 26E

Typhloroncus diabolus Muchmore 1982b:73, Figs. 27–29; Mahnert 1984a:677, Fig. 51; Muchmore 1986:28; Harvey 1991:322; Ceballos 2004:428; Harvey 2013:unpaginated.

Material examined.—*Holotype.* MEXICO: *Veracruz*: female, Cueva del Diablo, 3 km SSW. of Ciudad Mendoza (18°47′N, 97°11′W), 7 March 1973, J.R. Reddell, S. Murphy (FSCA, WM3415.01001).

Diagnosis.—*Typhloroncus diabolus* is a large, blind troglobite that differs from *T. attenuatus* by the lack of lanceolate setae on the leg tarsi, and from *T. troglobius* and *T. xilitlensis* by the less slender pedipalpal segments, e.g., femur of female 4.5 × longer than broad, and chela (without pedicel) of female 4.5 × longer than broad.

Description.—*Adult:* See Muchmore (1982b) and (Mahnert 1984a).

Remarks.—*Typhloroncus diabolus* was described by Muchmore (1982b) from a single female from Cueva del Diablo, Mexico (Fig. 26E). Mahnert (1984a) provides an illustration of the chelal trichobothrial pattern.

Typhloroncus planodentatus Harvey & Muchmore sp. nov.
Figs. 26E, 31

Material examined.—*Holotype*. MEXICO: *San Luis Potosí*: male, 20 miles S. of Vallea (most likely Ciudad Valles; see Remarks) (21°41′N, 98°58′W), 14 April 1946 [L.I.] Davis (AMNH, Hoff slide S–1194).

Paratype. MEXICO: *Tamaulipas*: 1 female, Gomez Farias (23°03′N, 99°09′W), 15 February 1970, J.A.L. Cooke (FSCA, WM2103.01001).

Other material. MEXICO: *Tamaulipas*: 1 male, Mesa Llera (23°19′N, 99°01′W), 16 May 1974, epigean, Elliott *et al*. (FSCA, WM3872.01001).

Diagnosis.—*Typhloroncus planodentatus* is the only known species of the genus that possesses eyes (Figs. 31A, 31B).

Description.—*Adult:* Color: pedipalps red-brown; carapace light red-brown; legs and abdomen pale yellow-brown.

Setae: generally long, straight and acicular.

Chelicera: hand with 6 (occasionally 7) setae; movable finger with 1 submedial seta; galea very slender and elongate; fixed finger with 7 (male), 7 (female) small teeth; movable finger with 8 (male), 8 (female) small teeth; rallum of 4 blades, each with small serrations; lamina exterior absent.

Pedipalp (Fig. 31C). Mostly smooth except for retrolateral face of trochanter, and the prolateral faces of the femur, patella and chela, which are lightly tuberculate; trochanter 2.45–2.64 (male), 2.33 (female), femur 3.58–4.57 (male), 3.70 (femle), patella 2.84–3.47 (male), 2.78 (female), chela (with pedicel) 3.46–4.06 (male), 3.13 (female), chela (without pedicel) 3.27–3.81 (male), 2.94 (female), hand 1.32–1.52 (male), 1.25 (female) x longer than broad, movable finger 1.54–1.57 (male), 1.38 (female) x longer than hand (without pedicel). Fixed chelal finger and hand with 22 trichobothria, movable chelal finger with 10 trichobothria (Fig. 31E): *eb*, *esb* and *isb* in straight row at base of finger; *eb* region with 1 trichobothrium; *ib* region with 5 trichobothria; *ist* region with 6 trichobothria; *est* region with 6 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 6 trichobothria; *sb* not dorsally displaced relative to *st*; *t* region not overlapping with *est* region. Venom apparatus present in both chelal fingers, venom duct terminating in nodus ramosus slightly distal to *est* region in fixed finger and within *t* region in movable finger. Chelal teeth: fixed finger with 54–55 (male), 48 (female) teeth, truncate and flat-topped, becoming slightly angulate in basal half of finger (Fig. 31G); movable finger with ca. 45–48 (male), 40 (female) teeth, truncate and flat-topped (Fig. 31F); base of fixed chelal finger with several small denticles.

Carapace (Fig. 31A): lateral margins evenly convex; 1.34 (male) x longer than broad (female distorted); with 2 small bulging eyes; with anterior margin medially prominent; with 18 setae including 4 on anterior margin and 4 on posterior margin; without furrows.

Coxal region: manducatory process somewhat pointed, with 2 apical acuminate setae; chaetotaxy: 2 + 5: 4: 5: 5: 5 (male); 2 + 6: 5–6: 4: 5: 6 (female).

Legs: femur + patella 2.21–2.33 (male), 2.42 (female) x longer than deep; subterminal tarsal setae acuminate, without additional rami (Fig. 31D); arolium slightly shorter than claws, not divided, with ventral hooked process (Fig. 31D).

Abdomen: tergites and sternites not divided and uniseriate. Tergal chaetotaxy: male, 4: 4: 8: 8: 8: 8: 8: 10: 10: 10: 6 (including 4 tactile setae): 2; female, 4: 5: 8: 8: 8: 8: 9: 9: 10: 5 (including 4 tactile setae): 2. Sternal chaetotaxy: male, 7: (1) 8 [3 + 3] (1): (1) 4 (1): 8: 8: 10: 10: 11: 10: 4 (including 2 tactile setae): 2; female, 7: (1) 6 (1): (1) 5 (1): 8: 8: 8: 9: 11: 10: 4

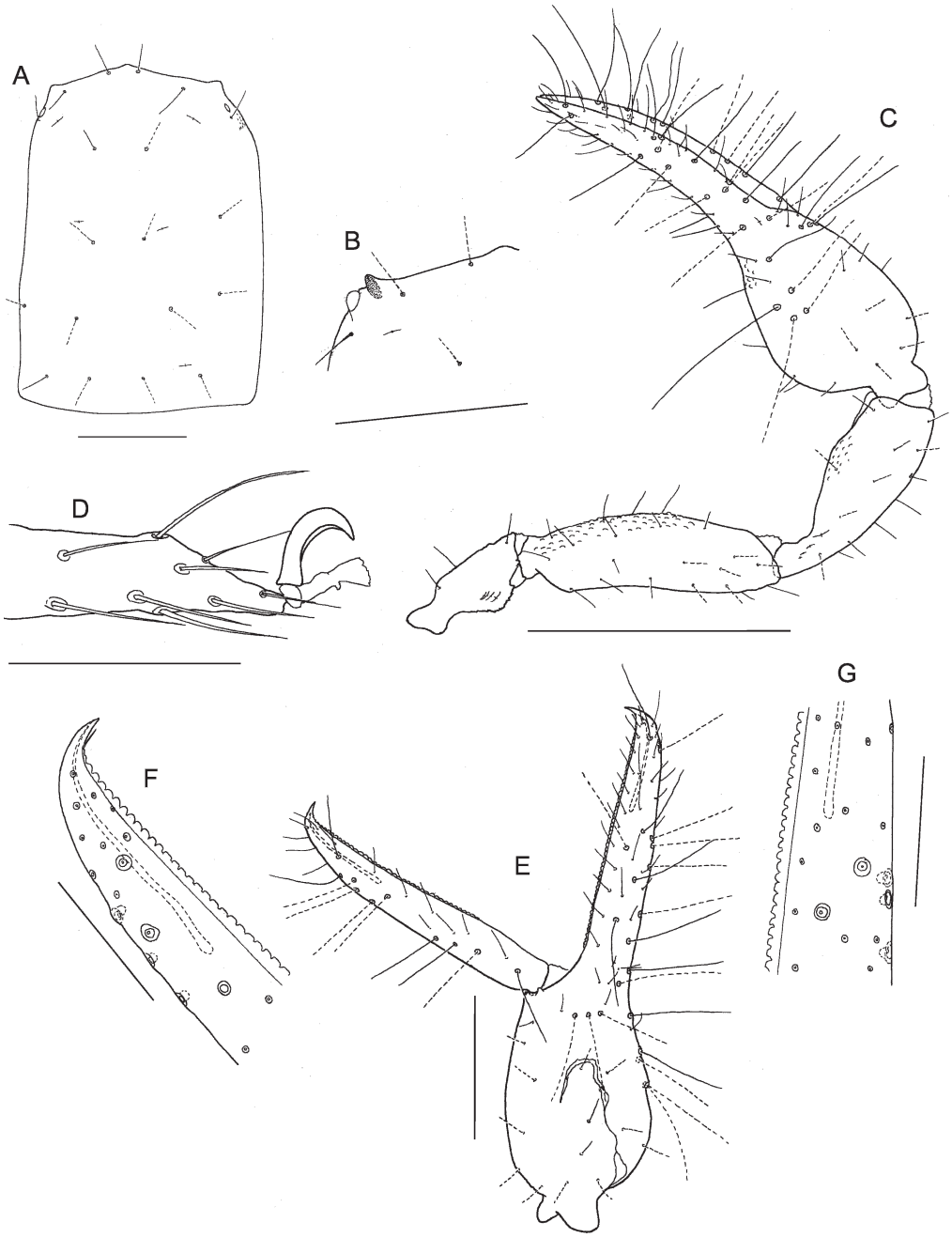

Figure 31.—*Typhloroncus planodentatus* Harvey & Muchmore sp. nov., male holotype, unless stated otherwise: A. Carapace, dorsal, male paratype (FSCA, WM3872.01001); B. Carapace, region of left eye, dorsal; C. Right pedipalp, dorsal; D. Tip of left tarsus IV, paratype female (FSCA, WM2103.01001); E. Left chela, lateral; F. Tip of movable chelal finger, lateral; G. fixed chelal finger, lateral. Scale lines = 0.5 mm (C); 0.2 mm (A, B); 0.1 mm (E–G).

(including 2 tactile setae): 2. Setae of tergites and sternites IX–XI acuminate. Anterior margin of anal operculum touching posterior margin of sternite XI (Fig. 30C).

Genitalia: male with median genital sac not visible in material examined. Female with large gonosac which is covered with scattered pores.

Dimensions (mm): Males: holotype followed by other males (where applicable): Body length ca. 1.65 (2.22). Pedipalp: trochanter 0.274/0.112 (0.335/0.127), femur 0.505/0.141 (0.672/0.147), patella 0.435/0.153 (0.573/0.165), chela (with pedicel) 0.918/0.265 (1.160/0.286), chela (without pedicel) 0.866 (1.090), hand (without pedicel) length 0.350 (0.435), movable finger length 0.538 (0.686). Chelicera 0.264, movable finger length 0.127. Carapace ?/? (damaged) (0.607/0.454); eye diameter 0.026 (0.016). Leg I: femur 0.243/0.076, patella 0.141/0.069, tibia 0.187/0.055, metatarsus 0.118/0.043, tarsus 0.202/0.038. Leg IV: femur + patella 0.444/0.201 (0.518/0.222), tibia 0.320/0.082, metatarsus 0.166/0.058, tarsus 0.266/0.042.

Female: Body length 2.13. Pedipalp: trochanter 0.298/0.128, femur 0.573/0.155, patella 0.461/0.166, chela (with pedicel) 1.003/0.320, chela (without pedicel) 0.942, hand (without pedicel) length 0.400, movable finger length 0.552. Chelicera 0.296/0.147, movable finger length 0.177. Carapace 0.551/? (distorted); eye diameter 0.026. Leg I: femur 0.273/0.084, patella 0.138/0.077, tibia 0.216/0.057, metatarsus 0.120/0.049, tarsus 0.203/0.030. Leg IV: femur + patella 0.201/0.193, tibia 0.347/0.087, metatarsus 0.170/0.062, tarsus 0.267/0.045.

Remarks.—*Typhloroncus planodentatus* is the first species of the genus to be found that possesses eyes, as all others, including the type species from the US Virgin Islands, completely lack eyes (Muchmore 1979, 1982b, 1986). The specimen from Mesa Llera differs from the other two specimens by having a substantially smaller eye diameter, 0.016 mm in the Mesa Llera specimen (Fig. 31B) and 0.026 mm in the others (Fig. 31A). However, we refrain from referring this specimen to a new species, as the differences are slight, and they have all been collected near each other.

Typhloroncus planodentatus has been found only on three occasions in the neighboring Mexican states of Tamaulipas and San Luis Potosí (Fig. 26E). Even though the hand-written slide label of the male holotype from San Luis Potosí clearly reads ''20 MILES S. OF VALLEA'', the locality is most likely south of Ciudad Valles. The collector of the specimen, L. Irby Davis, collected widely in the area during the late 1930s and to the mid–1940s (e.g., Archer 1953; Gertsch & Davis 1946; Lowery & Newman 1951), and the spelling on the slide label appears to be a minor transcription error.

Etymology.—The specific epithet refers to the flattened teeth of the fixed chelal finger, *planus*, Latin, even, flat, level, smooth, and *dentatus*, Latin, toothed, pointed (Brown 1956).

Typhloroncus troglobius Muchmore 1982
Fig. 26E

Typhloroncus troglobius Muchmore, 1982b:71–73, Figs. 24–26; Mahnert 1984a:677, Fig. 49; Muchmore 1986:28; Harvey 1991:322; Ceballos 2004:428; Harvey 2013:unpaginated.

Material examined.—*Holotype.* MEXICO: *Puebla*: female, Grutas de Atepolihuit, 5 km SW. of Cuetzalan (19°59′N, 97°33′W), 18 December 1976, J.R. Reddell, D. McKenzie, C. Solieau (FSCA, WM4676.01001).

Diagnosis.—*Typhloroncus troglobius* is a large, blind troglobite that differs from *T. attenuatus* by the lack of lanceolate setae on the leg tarsi, and from the other congeneric troglobites (*T. diabolus* and *T. xilitlensis*) in being slightly smaller, e.g., pedipalpal femur of female 2.03 mm long, and chela (without pedicel) of female 3.11 mm long, compared with femur 2.34–2.37 mm long and chela (with pedicel) 3.73–3.77 mm long in *T. diabolus* and *T. xilitlensis*.

Description.—*Adult:* See Muchmore (1982b) and Mahnert (1984a).

Remarks.—*Typhloroncus troglobius* was described by Muchmore (1982b) from a single female from Grutas de Atepolihuit, Mexico (Fig. 26E). Mahnert (1984a) provides an illustration of the chelal trichobothrial pattern.

Typhloroncus xilitlensis Muchmore 1986
Fig. 26E

Typhloroncus xilitlensis Muchmore 1986: 28–30, Figs. 20–21; Harvey 1991:322; Ceballos 2004:428; Harvey 2013:unpaginated.

Material examined.—*Holotype.* MEXICO: *San Luis Potosí*: female, Sótano de Huitzmolotitla, 2 km NNW. of Xilitla (21°25′N, 99°00′W), 4 January 1982, O. Kukal (FSCA, WM6104.01001).

Diagnosis.—*Typhloroncus xilitlensis* is a large, blind troglobite that differs from other congeneric troglobites as follows: from *T. attenuatus* by the lack of lanceolate setae on the leg tarsi, from *T. troglobius* by its larger size, e.g.,pedipalpal femur of female 2.37 mm long, and chela (without pedicel) of female 3.77 mm long, compared with 2.03 mm and 3.11 mm, respectively, and from *T. diabolus* is having more slender pedipalpal segments, e.g., pedipalpal femur of female 7.65 × longer than broad, and chela (without pedicel) of female 6.85 × longer than broad.

Description.—*Adult:* See Muchmore (1986).

Remarks.—*Typhloroncus xilitlensis* was described by Muchmore (1986) from a single female from Sótano de Huitzmolotitla, Mexico (Fig. 26E).

Genus *Xorilbia* Harvey & Mahnert 2006

Xorilbia Harvey & Mahnert 2006:228.

Type species.—*Ideoroncus arboricola* Mahnert 1979, by original designation.

Diagnosis.—*Xorilbia* resembles *Mahnertius*, *Typhloroncus* and *Dhanus siamensis* in having arolia that are shorter than the claws, and that also have a small hooked protuberance. Unlike these genera, *Xorilbia* has a divided arolium.

Description.—*Adult:* See Harvey & Mahnert (2006). In addition: base of fixed chelal finger without small denticles.

Nymphs: Pedipalps: *Tritonymph*: fixed finger with 15 trichobothria, movable finger with 8 trichobothria; *eb* region with 1 trichobothrium; *ib* region with 4 trichobothria; *ist* region with 3 trichobothria; *est* region with 4 trichobothria; *et* slightly distal to *it*; *b* region with 2 trichobothria; *t* region with 5 trichobothria. *Deutonymph*: not documented. *Protonymph: eb*, *et*, *ist* and *t* regions each with 1 trichobothrium; others absent.

Remarks.—*Xorilbia* occurs in the Amazonian region of northern Brazil and southern Venezuela (Figs. 2A, 26F).

KEY TO SPECIES OF *XORILBIA*

1. Fixed chelal finger with basal teeth forming broad lamella . . . . . *X. lamellifer*
   Fixed chelal finger with basal teeth not forming broad lamella 2
2. Teeth of movable chelal finger distinct . . . . . *X. arboricola*
   Teeth of movable chelal finger barely discernable . . . . . *X. gracilis*

Xorilbia arboricola (Mahnert 1979)
Fig. 26F

Ideoroncus arboricola Mahnert 1979:753–755, Figs. 70–74; Adis et al. 1987:488; Saturnino et al. 2009:35.
Albiorix arboricola (Mahnert): Mahnert 1984a:672–673; Mahnert 1985a:78; Mahnert & Adis 1986:213; Mahnert et al. 1986:Fig. 10; Harvey 1991:316; Adis & Mahnert 1993:Fig. 5; Mahnert & Adis 2002:379, Fig. 10; Adis et al. 2002:5; Aguiar et al. 2006:796, etc.
Xorilbia arboricola (Mahnert): Harvey & Mahnert 2006:229; Harvey 2013 unpaginated.
Albiorix aff. *arboricola* (Mahnert): Mahnert 1984a:673 (see *Albiorix gracilis* Mahnert).

Material examined.—None.

Diagnosis.—*Xorilbia arboricola* lacks the broad dental lamella of the fixed chelal finger found in *X. lamellifer* and has distinct teeth on the movable chelal finger (Mahnert 1979, 1984a).

Description.—*Adult:* See Mahnert (1979, 1984a).

Remarks.—This species was originally described as a species of *Ideoroncus*, but transferred to *Albiorix* when it was found to have divided arolia (Mahnert 1984a). It was transferred to the new genus *Xorilbia* by Harvey & Mahnert (2006) and is known from the Brazilian states of Amazonas and Pará (Fig. 26F).

Xorilbia gracilis (Mahnert 1985)
Fig. 26F

Albiorix aff. *arboricola* (Mahnert): Mahnert 1984a:673.
Albiorix gracilis Mahnert 1985b:223–224, Figs. 27–28; Mahnert & Adis 1986:213; Adis and Mahnert 1990:13, Figs. 2–3; Harvey 1991:317; Adis & Mahnert 1993:435, Figs. 2–3, 5; Mahnert & Adis 2002:379; Adis et al. 2002:5; Aguiar et al. 2006:795, 796, etc.; Saturnino et al. 2009:35.
Xorilbia gracilis (Mahnert): Harvey & Mahnert 2006:229–230.
Xorilbia cf. *gracilis* (Mahnert): Turienzo et al. 2010:561, 584–585.

Material examined.—See Harvey & Mahnert (2006).

Diagnosis.—*Xorilbia gracilis* lacks the broad dental lamella of the fixed chelal finger found in *X. lamellifer* and has barely discernible teeth on the movable chelal finger (Mahnert 1985b).

Description.—*Adult:* See Mahnert (1985b).
Nymphs: See Mahnert (1985b).

Remarks.—This species was originally described in the genus *Albiorix* (Mahnert 1985b), but was transferred to the new genus *Xorilbia* by Harvey & Mahnert (2006). It is only known from the Brazilian state of Amazonas, and the Venezuelan state of the same name (Harvey & Mahnert 2006) (Fig. 26F).

Xorilbia lamellifer (Mahnert 1985)
(Fig. 26F)

Albiorix lamellifer Mahnert 1985:224–225, Figs. 29–31; Mahnert & Adis 1986:213; Harvey 1991:317; Mahnert & Adis 2002:379; Saturnino et al. 2009:36.
Xorilbia lamellifer (Mahnert): Harvey & Mahnert 2006:230, Fig. 1; Harvey 2013:unpaginated.

Material examined.—See Harvey & Mahnert (2006).

Diagnosis.—*Xorilbia lamellifer* differs from the other two species of the genus by the fusion of the basal teeth of the fixed chelal finger into a broad lamella (Mahnert 1985b, Fig. 31).

Description.—*Adult:* See Mahnert (1985b).

Remarks.—This species was originally described in *Albiorix* (Mahnert 1985b), but was transferred to the new genus *Xorilbia* by Harvey & Mahnert (2006). It is only known from the Brazilian state of Amazonas (Fig. 26F).

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