The species treated in the following article (*Imantodes tenuissimus*, *Lampropeltis triangulum* and *Stenorrhina freminvillii*) are prominent representatives of a regional snake fauna, and often have been encountered during ongoing nocturnal snake surveys in the Chetumal area of southern Quintana Roo, Mexico. The frequency patterns of the collected snakes shed light on their annual seasonal activity. The finding that *Stenorrhina freminvillii* seems to be mostly inactive during the wettest months of the year is one of the unexpected results of this long-term monitoring project. Pictured here is a juvenile *Lampropeltis triangulum* (ECO-CH-H 3970) from between Calderitas and Ruínas de Oxtankah, Quintana Roo, Mexico, a predominantly nocturnal snake with a diet consisting mostly of small mammals.

Mesoamerican Herpetology
www.mesoamericanherpetology.com
Eagle Mountain PUBLISHING, LC
www.eaglemountainpublishing.com
OPEN ACCESS

The Chetumal Snake Census: generating biological data from road-killed snakes. Part 5. *Imantodes tenuissimus, Lampropeltis triangulum*, and *Stenorrhina freminvillii*

Gunther Köhler[1], J. Rogelio Cedeño-Vázquez[2], Elias Darius Kraus[1], Pablo M. Beutelspacher-García[3], and Juan Alonso Domínguez-Lepe[4]

[1]*Senckenberg Forschungsinstitut und Naturmuseum, Senckenberganlage 25, 60325 Frankfurt am Main, Germany. E-mail*: gkoehler@senckenberg.de (Corresponding author)

[2]*Depto. Sistemática y Ecología Acuática, Grupo Académico: Sistemática, Ecología y Manejo de Recursos Acuáticos, El Colegio de la Frontera Sur, Unidad Chetumal, Av. Centenario Km. 5.5, C.P. 77014 Chetumal, Quintana Roo, Mexico. E-mail*: rcedenov@ecosur.mx

[3]*Martinica 342, Fracc. Caribe, C.P. 77086 Chetumal, Quintana Roo, Mexico. E-mail*: bothropspacher@hotmail.com

[4]*Jardín Zoológico Payo Obispo. Av. Insurgentes s/n, Chetumal, Quintana Roo, Mexico.*

Abstract: We present data and observations on the snake species *Imantodes tenuissimus*, *Lampropeltis triangulum*, and *Stenorrhina freminvillii* collected during bimonthly surveys along a 39 km road transect near the city of Chetumal, Quintana Roo, Mexico, from February of 2010 to October of 2017. For these species, we present data on their external morphology, seasonality, spatial distribution, reproduction, and diet.

Key Words: Colubridae, diet, Dipsadidae, Mexico, monitoring, population dynamics, Quintana Roo, reproduction, road-kills, seasonality, snake survey

Resumen: Presentamos datos y observaciones sobre las especies de serpientes *Imantodes tenuissimus*, *Lampropeltis triangulum* y *Stenorrhina freminvillii* registradas durante muestreos realizados cada 15 días desde febrero de 2010 hasta octubre de 2017, a lo largo de un transecto de carretera de 39 km cercano a la ciudad de Chetumal (Quintana Roo, México). De cada una de estas especies presentamos datos sobre morfología externa, estacionalidad, distribución espacial, reproducción y dieta.

Palabras Claves: Colubridae, dieta, dinámica poblacional, Dipsadidae, Mexico, mortalidad por atropello, muestreo y monitoreo de serpientes, Quintana Roo, reproducción, temporalidad

Citation: Köhler, G., J. R. Cedeño-Vázquez, E. D. Kraus, P. M. Beutelspacher-García, and J. A. Domíguez-Lepe. 2017. The Chetumal Snake Census: generating biological data from road-killed snakes. Part 5. *Imantodes tenuissimus*, *Lampropeltis triangulum*, and *Stenorrhina freminvillii*. Mesoamerican Herpetology 4: 774–789.

Received: 13 November 2017; **Accepted:** 1 December 2017; **Published:** 30 December 2017.

INTRODUCTION

In previous articles (Köhler et al., 2016a, b, c, 2017), we introduced our long-term snake survey study based on snakes found along a 39 km road transect in southern Quintana Roo, Mexico. Here we report the data for three species of snakes of the genera *Imantodes*, *Lampropeltis*, and *Stenorrhina*, generated from road-killed specimens and supplemented by observations of living individuals found on the road during our nocturnal surveys. From 13 February 2010 to 28 October 2017, we recorded 32 specimens of *I. tenuissimus*, 13 of *L. triangulum*, and 15 of *S. freminvillii* (see Appendix 1 for list of specimens examined). For measurements, we use the abbreviations SVL (snout–vent length) and TL (tail length). Most recent authors have accepted the taxonomy for the *Lampropeltis triangulum* species complex proposed by Ruane et al. (2014). In this work, however, the authors did not include any samples from the Yucatan Peninsula, and thus their assignment of the taxon occurring in this region to *L. abnorma* was conjecture, as evidenced by the question marks on their maps (p. 233) and statement that this species "likely" occurs on the Yucatan Peninsula (p. 247). Whereas we appreciate the substantial increase in systematic knowledge provided by Ruane et al. (2014) and concur that this complex of snakes consists of several distinct species, we prefer to refer to the taxon in this article as *Lampropeltis triangulum* until the systematics of this group of snakes is clarified for this geographic portion of its range.

SPECIES ACCOUNTS

Imantodes tenuissimus (Cope, 1867)

Material: We collected 28 specimens of *Imantodes tenuissimus* (Fig. 1), of which we identified 21 as males, seven as females, and one of undetermined sex. Additionally, we recorded three live individuals, an adult male and two individuals of undetermined sex, found crossing the road.

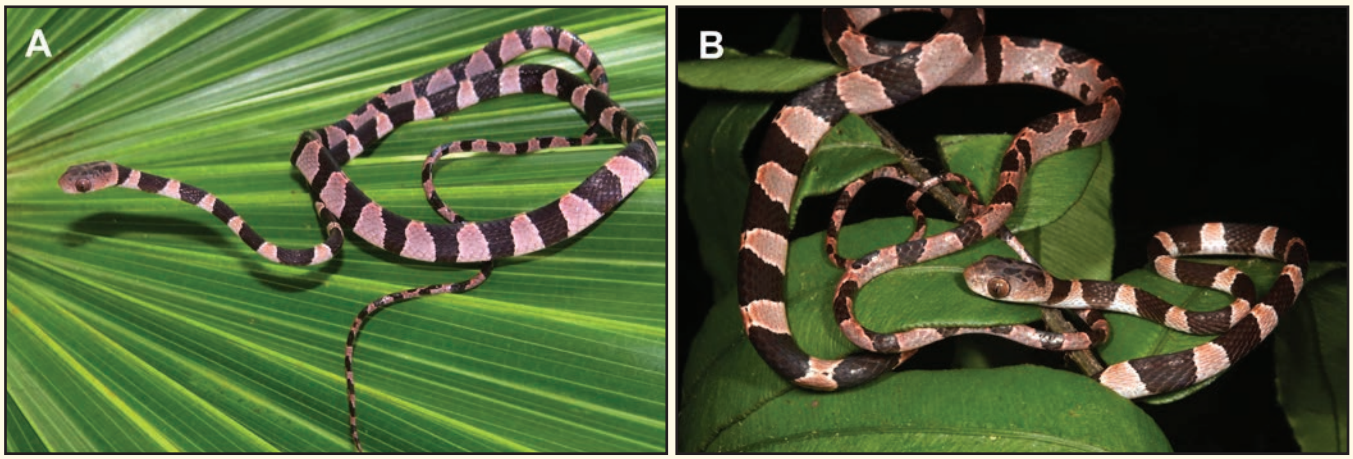

Fig. 1. *Imantodes tenuissimus* in life. (A) Not collected (campus of ECOSUR, Chetumal, Quintana Roo, Mexico); and (B) SMF 100328 (subadult male). © J. Rogelio Cedeño-Vázquez (A) and Gunther Köhler (B)

External morphology: See Table 1 for variation in selected morphometric and scalation characters.

Diet: In the gastrointestinal tract of three specimens of *Imantodes tenuissimus* **(**ECO-CH-H 3460, 3714, SMF 103699**)** we found remains of *Norops*, mostly mandibular bones, skin fragments, and foot parts (Fig. 2). Along with the *Norops* remains, ECO-CH-H 3714 also contained an undigested soft-shelled lizard egg, which we assume came from the consumed lizard.

Table 1. Selected measurements, proportions, and scale characters of *Lampropeltis triangulum, Stenorrhina freminvillii,* and *Imantodes tenuissimus.* Range is followed by mean value and standard deviation in parentheses. See text for abbreviations.

		Lampropeltis triangulum ♂ **7** ♀ **1**	***Stenorrhina freminvillii*** ♂ **7** ♀ **5**	***Imantodes tenuissimus*** ♂ **20** ♀ **7**
SVL (mm)	Males	394–895 (515.2 ± 213.81)	323–630 (536.3 ± 104.79)	437–670 (537.2 ± 60.13)
	Females	793 (739.0 ± 0.00)	480–638 (572.6 ± 78.13)	493–637 (560.9 ± 44.10)
TL / SVL	Males	0.18–0.19 (0.182 ± 0.0056)	0.15–0.18 (0.164 ± 0.0101)	0.45–0.50 (0.471 ± 0.0180)
	Females	0.18 (0.179 ± 0.0000)	0.13–0.14 (0.131 ± 0.0050)	0.44–0.45 (0.445 ± 0.0070)
Ventrals	Males	210–222 (216.2 ± 4.84)	154–174 (165.2 ± 5.79)	232–250 (244.7 ± 4.61)
	Females	142 (142.0 ± 0.00)	165–174 (167.8 ± 3.63)	240–252 (246.3 ± 5.62)
Subcaudals	Males	52–58 (54.4 ± 2.13)	30–34 (31.7 ± 1.50)	150–164 (155.9 ± 3.63)
	Females	41 (41.0 ± 0.00)	27–29 (28.0 ± 1.15)	140–151 (145.9 ± 3.80)
Number of dorsal scales rows at midbody		21–23 (22.8 ± 0.63)	17 (17.0 ± 0.00)	17 (17.0 ± 0.00)
Number of dorsal scales rows anterior to vent		14–19 (18.1 ± 1.66)	17 (17.0 ± 0.00)	17 (17.0 ± 0.00)
Cloacal scute		undivided	divided	divided
Number of loreal scales		0–1 (1.0 ± 0.16)	0–1 (0.7 ± 0.44)	1 (1.0 ± 0.00)
Number of preocular scales		1 (1.0 ± 0.00)	0–1(1.0 ± 0.14)	1 (1.0 ± 0.00)
Number of postocular scales		1–2 (1.7 ± 0.48)	1–2 (2.0 ±0.29)	1–3 (2.0 ± 2.77)
Number of anterior temporals		2 (2.0 ± 0.00)	1 (1.0 ±0.00)	1– 2 (1.6 ± 0.43)
Number of posterior temporals		2–3 (2.9 ± 0.32)	2 (2.0 ± 0.00)	1–3(1.9 ± 0.29)
Number of supralabials		7–8 (7.1 ± 0.16)	6–7 (7.0 ± 0.14)	7–9 (8.1 ± 0.34)
Number of infralabials		8–9 (8.2 ± 0.26)	7 (7.0 ± 0.00)	8–11 (9.8 ± 0.59)

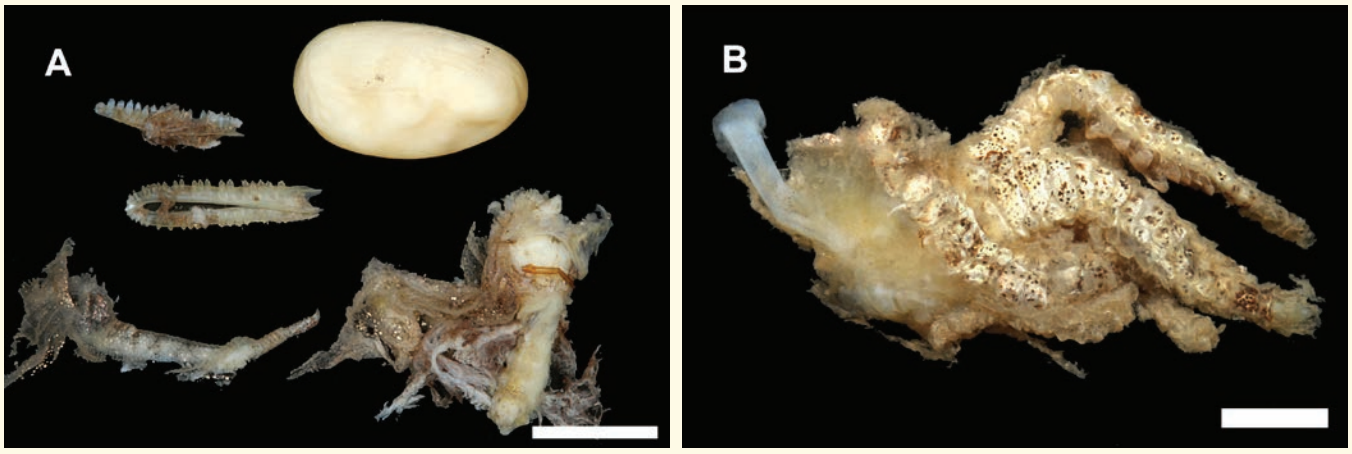

Fig. 2. Remains of food items found in the gastrointestinal tract of *Imantodes tenuissimus*. (A) Egg, mandibular and maxillary bones, toe of *Norops* from ECO-CH-H 3714; and (B) *Norops* foot from SMF 103699. Scale bar equals 5 mm in A, and 1 mm in B. © Gunther Köhler

Reproduction: The dissection of six male and five female specimens of *Imantodes tenuissimus* yielded data on reproduction (also see Fig. 3). The relative testis size (ratio of testis length × width/SVL) in the six males was 0.016–0.050 (0.037 ± 0.011). We found the largest relative testis size in a specimen collected on 29 August, and the smallest in a specimen preserved on 29 July. The relative ovary size (ratio of ovary length × width/SVL) in the five females was 0.025–0.072 (0.050 ± 0.018). We detected the largest relative ovary size in a female collected on 10 October and the smallest in a female collected on 1 November. Three females had countable follicles. The number of vitellogenic follicles per side ranged from 3 to 5. The follicle length was 2.4–6.7 (3.98 ± 1.75), and the follicle width 1.6–2.2 (1.94 ± 0.25). None of our specimens contained oviducal eggs.

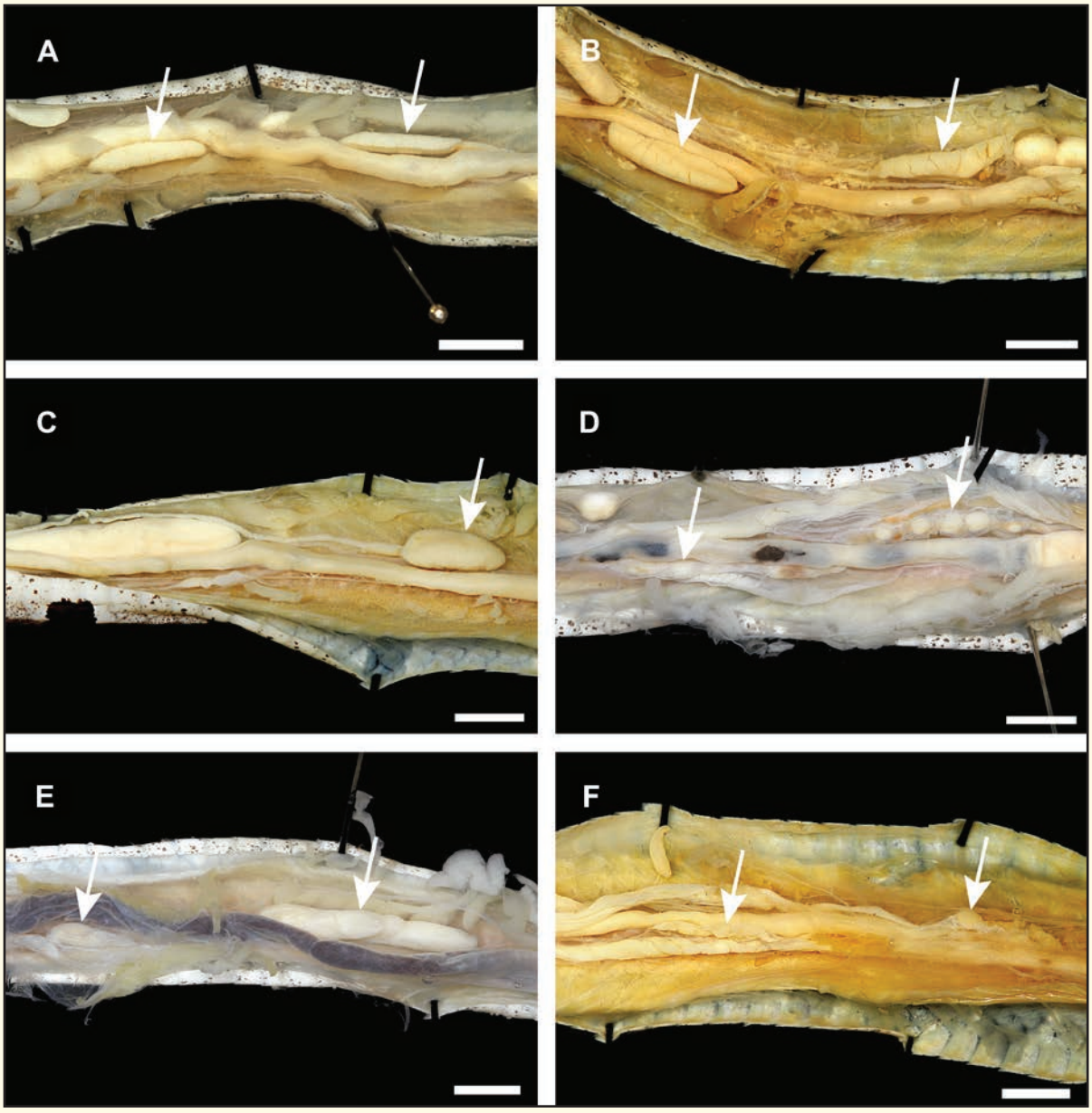

Fig. 3. Specimens of *Imantodes tenuissimus* dissected to study their gonads. (A) ECO-CH-H 3701 (male); (B) SMF 103696 (male); (C) SMF 103701 (male); (D) ECO-CH-H 3594 (female); (E) ECO-CH-H 3714 (female); and (F) SMF 100540 (female). The testes and follicles, respectively, are indicated by arrows. Scale bars equal 5 mm. © Gunther Köhler

Seasonality: See Figure 4 for the temporal distribution of the 31 individuals of *Imantodes tenuissimus* encountered on our road transect from 13 February 2010 to 28 October 2017. We found this species year-round, but at higher frequency in the first half of the year (February through August).

Distribution in the transect: We recorded this species throughout the 39 km road transect (Fig. 5). We found 3.5% of the specimens in areas surrounded by cropland, 6.9% near settlements, 13.8% in areas surrounded by vegetation-covered open habitat, 3.4% adjacent to tree plantations, and 72.4% adjacent to natural forest.

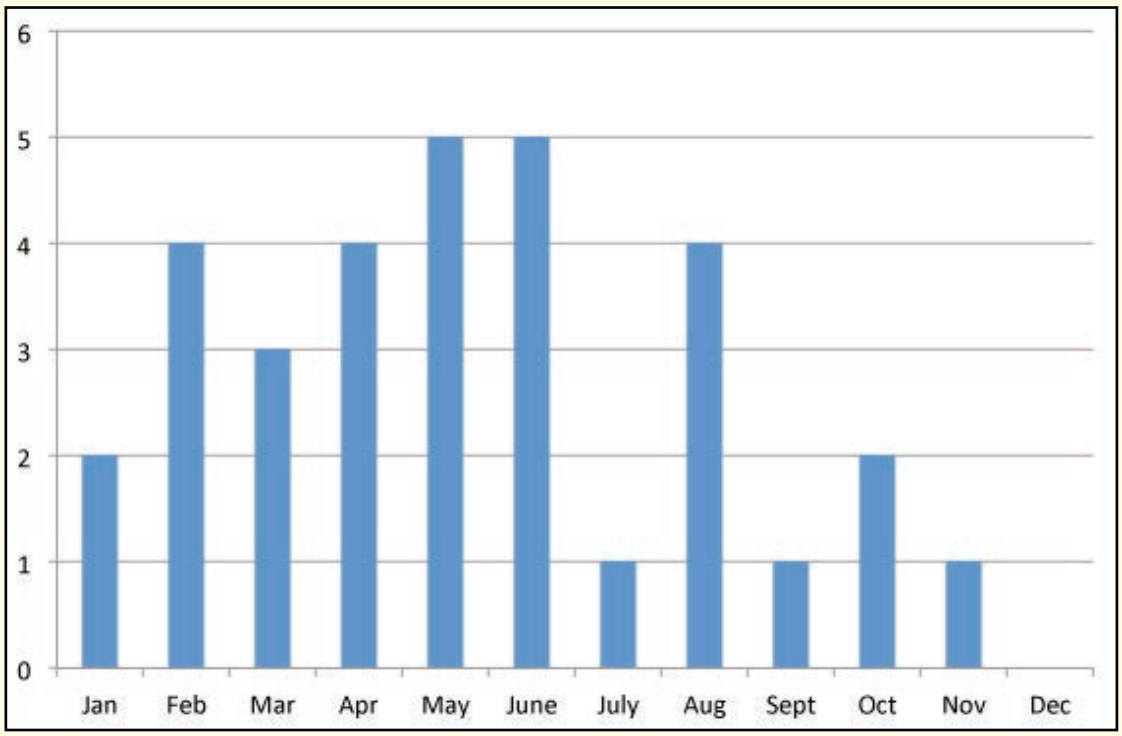

Fig. 4. Diagram showing the frequency distribution of collected specimens of *Imantodes tenuissimus* during the course of the year.

Lampropeltis triangulum (Lacépède, 1789)

Material: We collected 11 specimens of *Lampropeltis triangulum* (Fig. 6), of which we identified 10 as males, and one as a female. Additionally, we recorded two live individuals, an adult male and one individual of undetermined sex, found crossing the road.

External morphology: See Table 1 for variation in selected morphometric and scalation characters.

Diet: We identified the remains of a Gaumer's Spiny Pocket Mouse (*Heteromys gaumeri*) in the gastrointestinal tract of one specimen (SMF 103693; Fig. 7A–E). Several of the preserved specimens of *Lampropeltis triangulum* contained undigested hairs of small mammals (Fig. 7F).

Reproduction: The dissection of one male and one female specimen of *Lampropeltis triangulum* yielded data on reproduction (Fig. 8). The testis size in SMF 103693, collected 6 August 2011) was 50.6 mm × 5.9 mm (relative testis size 0.334). The ovary size in ECO-CH-H 3501, collected 8 July 2015, was 43.9 mm × 3.9 mm (relative ovary size 0.216) on the right side and 28.1 mm × 4.7 mm (relative ovary size 0.167) on the left side. It contained one vitellogenic follicle on the right side and four on the left, with a follicle size ranging from 7.1 mm × 4.1 mm (right side) to 8.1 × 4.1 mm (left side).

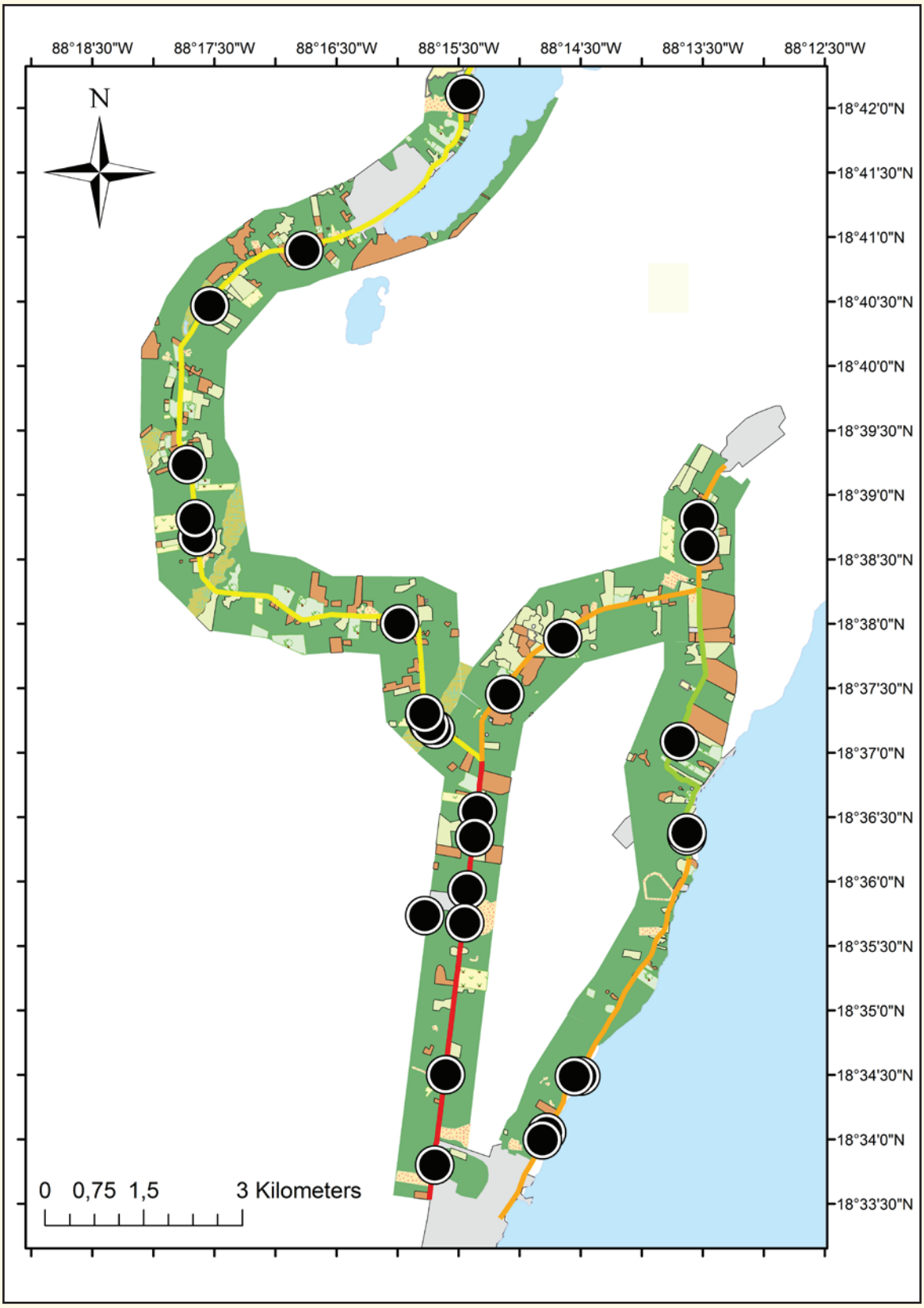

Fig. 5. Spatial distribution of the collected specimens (black dots with white margins) of *Imantodes tenuissimus* along the transect.

Fig. 6. A juvenile *Lampropeltis triangulum* (ECO-CH-H 3970) in life. © J. Rogelio Cedeño-Vázquez

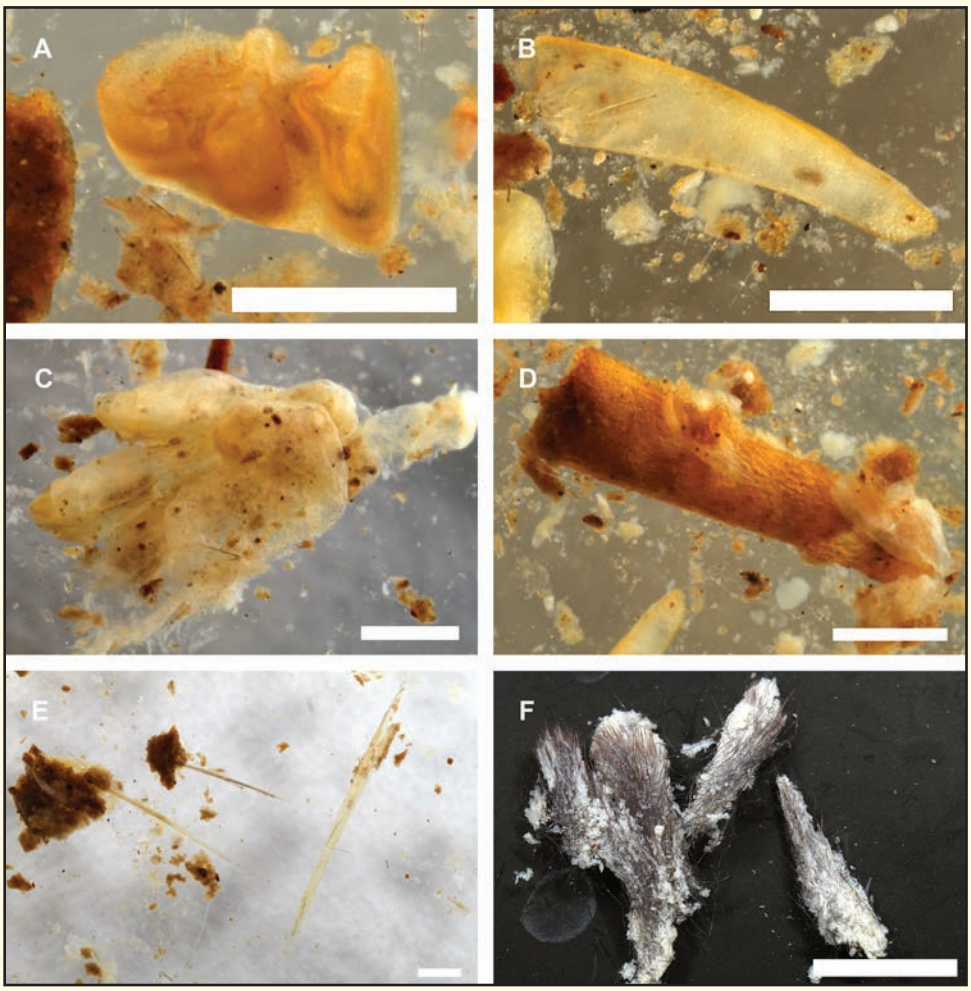

Fig. 7. Remains of food items found in the gastrointestinal tract of *Lampropeltis triangulum*. (A–E) Remains of a Gaumer's Spiny Pocket Mouse (*Heteromys gaumeri*) from the gastrointestinal tract of SMF 103693; (F) Undigested hairs of a small mammal from the gastrointestinal tract of ECO-CH-H 3057. Scale bar equals 1 mm in A–E, and 5 mm in F. © Gunther Köhler

Seasonality: See Figure 9 for the temporal distribution of the 13 individuals of *Lampropeltis triangulum* encountered on our road transect from 13 February 2010 to 28 October 2017. All our specimens were collected during the spring and summer months (February through August).

Distribution in the transect: We recorded this species throughout the 39 km road transect (Fig. 10). We found 7.7% of the specimens in areas surrounded by vegetation-free open habitat, 7.7% in areas surrounded by vegetation-covered open habitat, and 84.6% adjacent to natural forest.

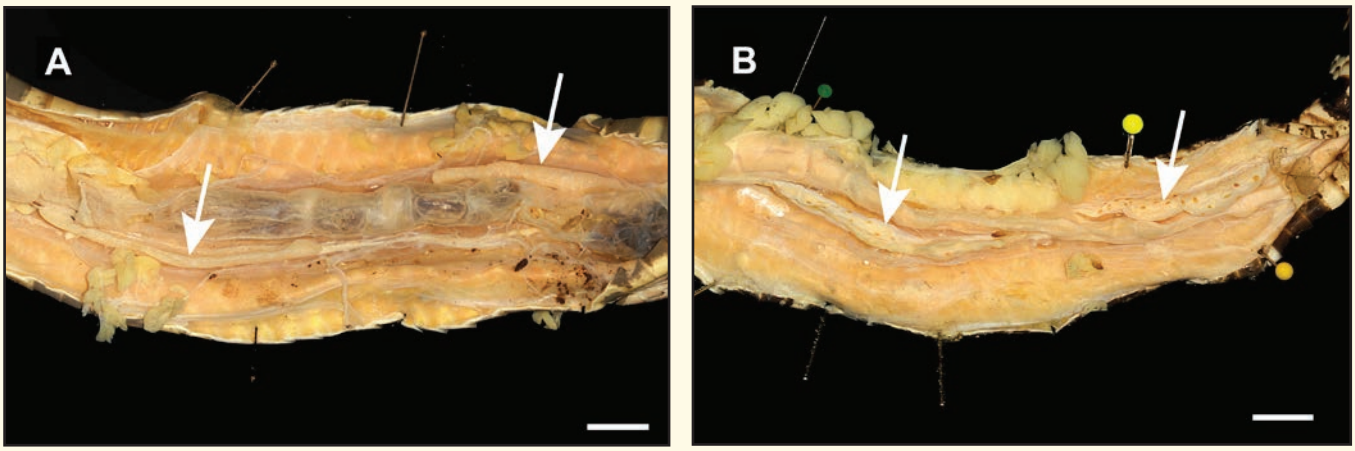

Fig. 8. Specimens of *Lampropeltis triangulum* dissected to study their gonads. (A) SMF 103693 (male); and (B) ECO-CH-H 3501 (female). The testes and follicles, respectively, are indicated by arrows. Scale bars equal 5 mm. © Gunther Köhler

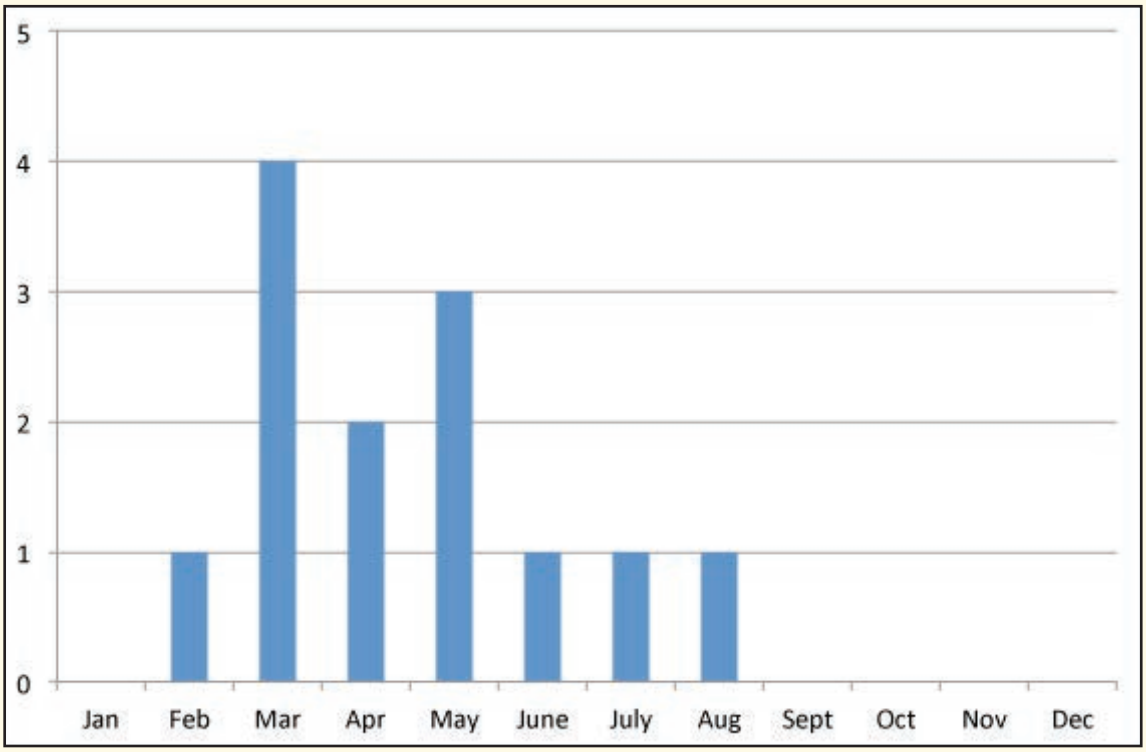

Fig. 9. Diagram showing the frequency distribution of collected specimens of *Lampropeltis triangulum* during the course of the year.

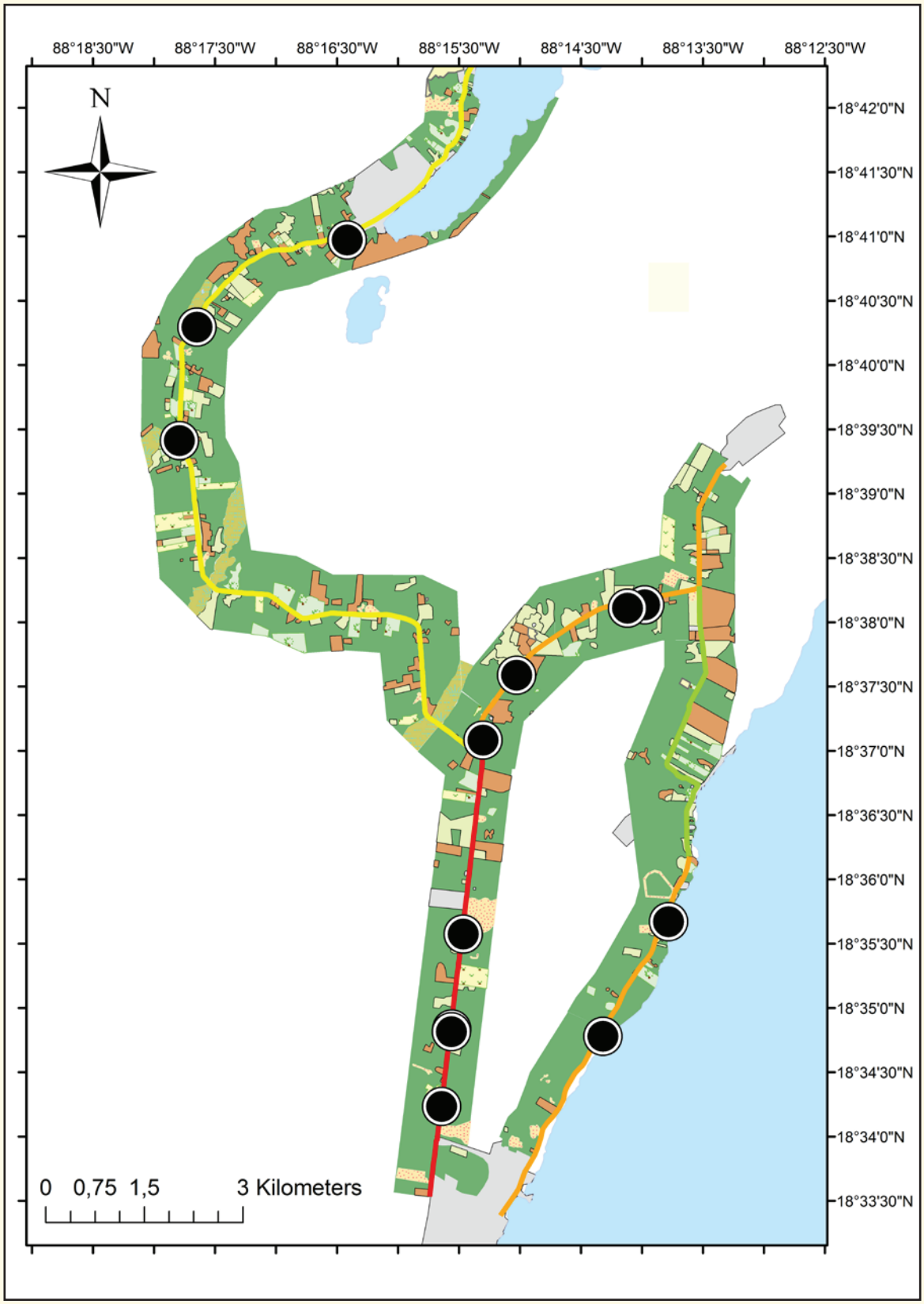

Fig. 10. Spatial distribution of the collected specimens (black dots with white margins) of *Lampropeltis triangulum* along the transect.

Stenorrhina freminvillii (Duméril, Bibron & Duméril, 1854)

Material: We collected 15 specimens of *Stenorrhina freminvillii* (Fig. 11), of which we identified 10 as males, and five as females.

External morphology: See Table 1 for variation in selected morphometric and scalation characters.

Diet: Seven of 12 dissected *Stenorrhina freminvillii* contained remains of bird spiders (most probably *Brachypelma vagans*) in its gastrointestinal tract (Fig. 12A). These were collected in the months of January (3 specimens), March (2), August (1), and November (1). In one specimen (SMF 103679), we found the remains of a scorpion and a whip spider (Amblypygi) (Fig. 12B).

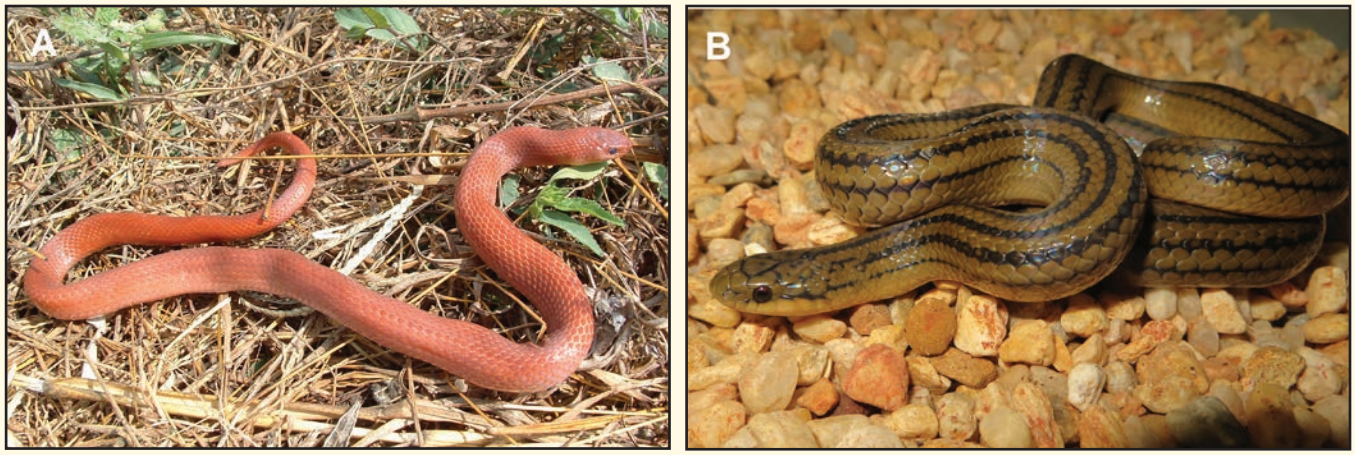

Fig. 11. *Stenorrhina freminvillii*. (A) Freshly dead individual from Xcalak, Quintana Roo, Mexico; and (B) in life (Rancho Santa Lupita, between Bacalar and Reforma, Quintana Roo, Mexico). © J. Rogelio Cedeño-Vázquez

Fig. 12. Remains of food items found in the gastrointestinal tract of *Stenorrhina freminvillii*. (A) Bird spider from SMF 103681; and (B) Amblypygi remains from SMF 103679. Scale bar equals 10 mm in A, and 5 mm in B. © Gunther Köhler

Reproduction: The dissection of four specimens of *Stenorrhina freminvillii* (2 males, 2 females) yielded data on reproduction (Fig. 13). The relative testis size (ratio of testis length × width/SVL) in the two males was 0.165 (collected 16 January 2016) and 0.195 (29 August 2015). The relative ovary size (ratio of ovary length × width/SVL) in the two females was 0.322 right / 0.369 left (collected 13 April 2013) and 0.293 right / 0.390 left (15 October 2017). In the female specimen (SMF 100694, collected 15 October 2017) contained 7 vitellogenic follicles

on the right side and 6 on the left, with a follicle size ranging from 4.6 × 4.2 mm to 6.6 × 3.2 mm (Fig. 13A). In the second female specimen (SMF 103681; SVL 655 mm, collected 14 January 2017) we counted 6 follicles on one side, with a follicle size ranging from 4.1 × 2.5 mm to 5.8 × 5.5 mm (Fig. 13B). None of our specimens contained oviducal eggs.

Seasonality: See Figure 14 for the temporal distribution of the 15 individuals of *Stenorrhina freminvillii* encountered on our road transect from 13 February 2010 to 28 October 2017. All our specimens were collected during the months of October through April with only one individual found during the months of May through September.

Distribution in the transect: We recorded this species mostly on the portion of our road transect between Calderitas and Laguna Guerrero; no specimen was found along the coastal road (Fig. 15). We found 21.4% of the specimens in areas surrounded by vegetation-covered open habitat and 78.6% adjacent to natural forest.

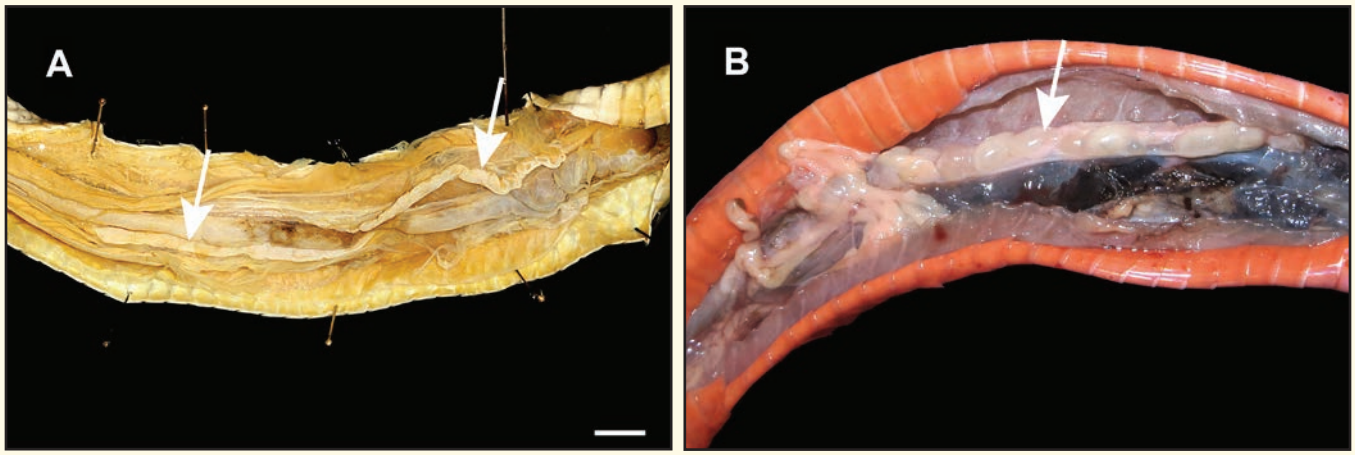

Fig. 13. Specimens of *Stenorrhina freminvillii* dissected to study their gonads. (A) SMF 100694 (female); (B) SMF 103681 (female). The follicles are indicated by arrows. Scale bar in A equals 5 mm. © Gunther Köhler (A) and Nidia Gabriela Blanco Campos (B)

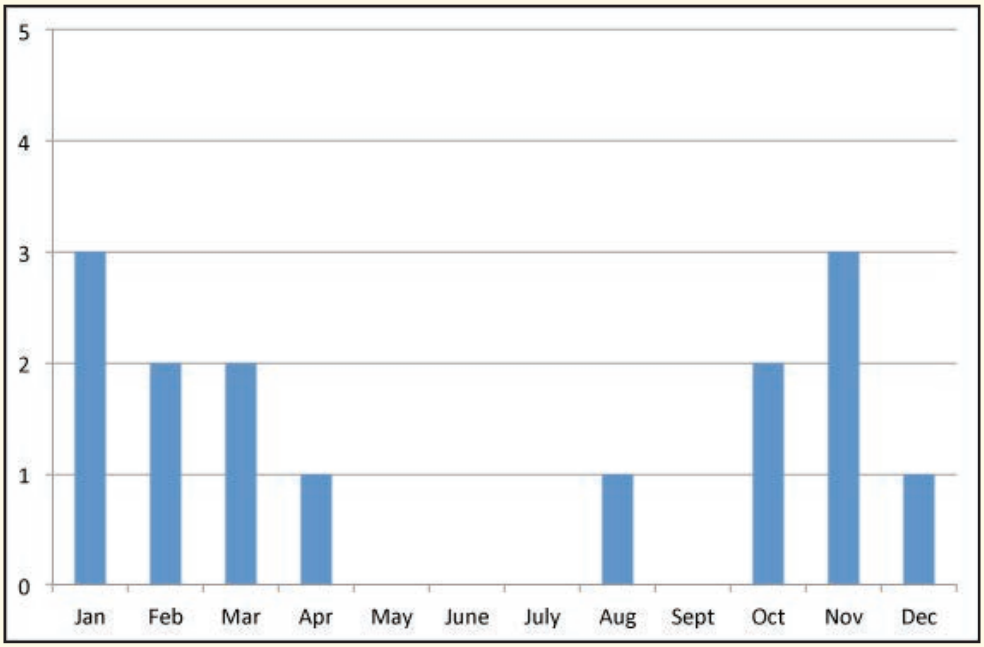

Fig. 14. Diagram showing the frequency distribution of collected specimens of *Stenorrhina freminvillii* during the course of the year.

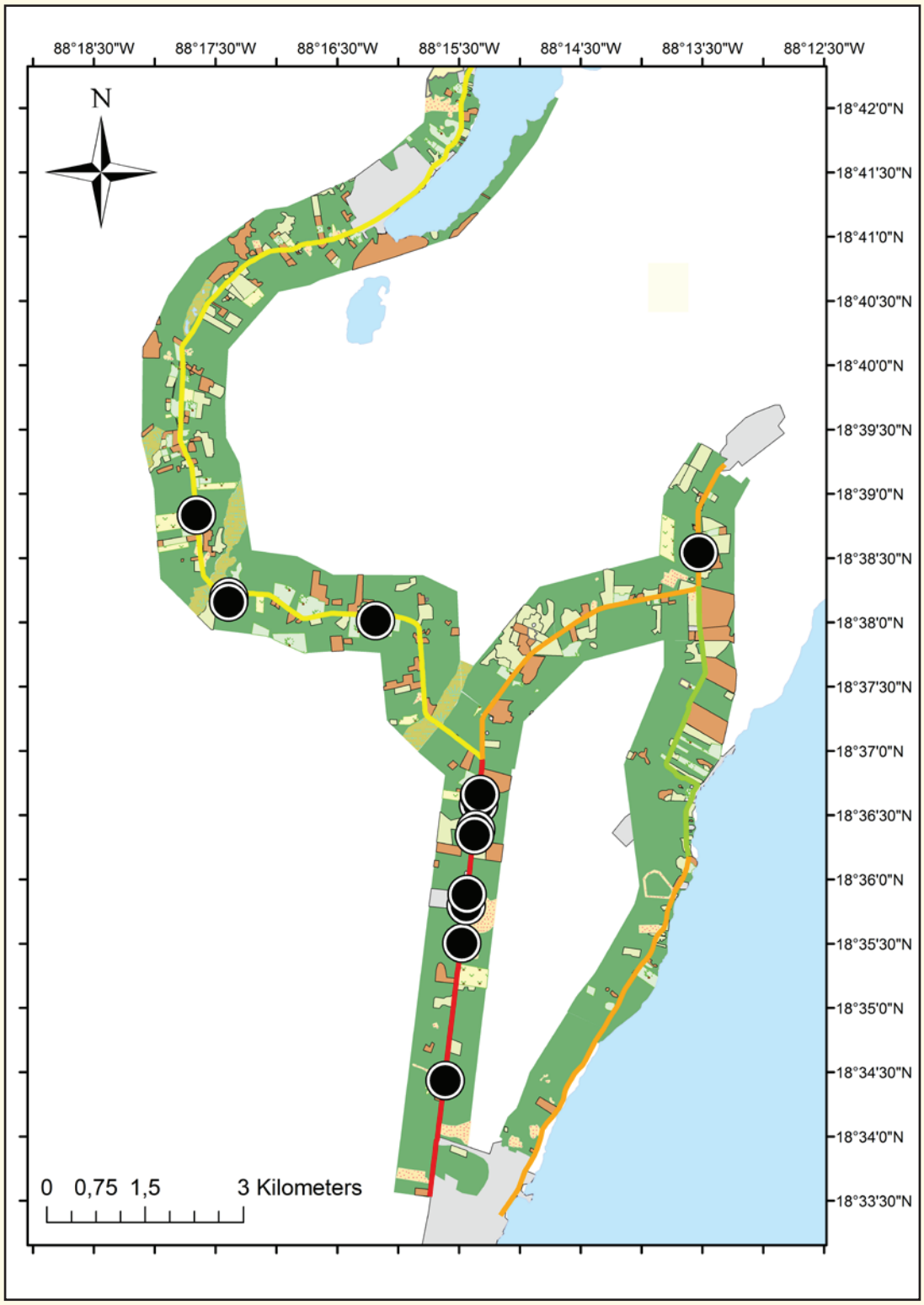

Fig. 15. Spatial distribution of the collected specimens (black dots with white margins) of *Stenorrhina freminvillii* along the transect.

DISCUSSION

We depict the annual number of collected specimens of the three species treated in this article in Figure 16. In *Imantodes tenuissimus*, a distinctive peak was evident in 2014, with gradually lower frequencies in the following years. For *Lampropeltis triangulum* we could not detect a clear trend of their occurrence during this almost eight-year period. Mostly, one or two individuals of this species were collected annually. We did not collect *Stenorrhina freminvillii* during the first three years of our study, and then observed a gradual increase in collecting frequency. Regarding the distribution of these three species within the transect, all were collected most frequently near natural forest. Whereas most snake species we documented along our road transect were found more frequently during the warmer and wetter summer months, *S. freminvillii* exhibits a contrasting pattern of seasonal activity. Most specimens we collected were found during the colder and dryer winter months, between October and March, with just a single individual encountered in April and August, respectively. We interpret our data as evidence for reduced activity in this species during the rainy season, in response to higher rates of precipitation. Although this period of reduced activity coincides with the summer months, technically it can not be called aestivation because this term is defined as a state of animal dormancy characterized by inactivity in response to high temperatures and arid conditions, and thus opposite of the conditions that seem to trigger the rainy season dormancy in the *S. freminvillii* studied by us. Presumably, this is a regional phenomenon in the relative humid Chetumal area, and populations of this species likely exhibit different annual patterns of seasonality in more arid regions.

Imantodes tenuissimus is a poorly known nocturnal snake that has been assumed to feed on lizards and frogs (Lee, 1996). Our findings confirm that anoles form a substantial portion of the species' diet. Lee (1996) reported upon a specimen of this species that contained three eggs.

In the Yucatan Peninsula, *Lampropeltis triangulum* has been noted to feed predominantly on small mammals, but also consumes lizards, small snakes, and frogs (Lee, 1996; Campbell, 1998). The preference for small mammals is supported by our dissection data of this species.

Stenorrhina freminvillii has been reported to feed on insects, spiders, and scorpions (Lee, 1996; Campbell, 1998; McCranie, 2011, and references therein). Our dissection data for this species are in agreement with these observations.

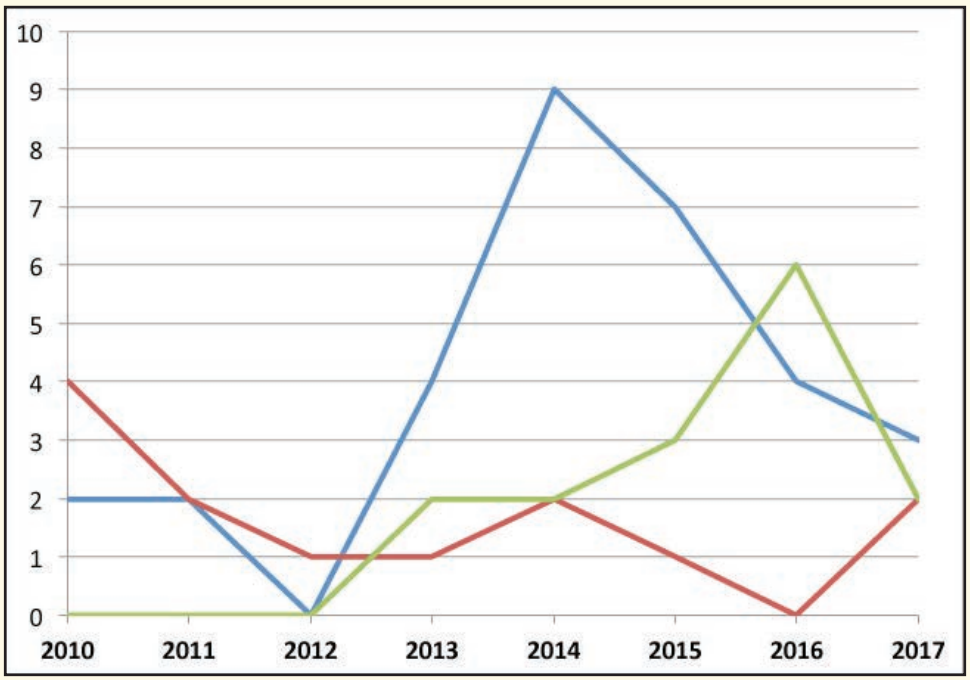

Fig. 16. The annual number of collected specimens of the three species treated in this paper. *Imantodes tenuissimus* (blue graph); *Lampropeltis triangulum* (red graph); and *Stenorrhina freminvillii* (green graph).

Acknowledgments.—Collecting and exportation permits (OFICIO NÚM. SGPA/DGVS/02570/15, OFICIO NÚM. SGPA/DGVS/01629/16, OFICIO NÚM. SGPA/DGVS/01205/17 issued to Fausto Méndez-de la Cruz with extensions to JRCV and GK) were issued by Martin Vargas-Prieto, Jorge Maksabedian-de la Roquette, and José Luis Pedro Funes Izaguirre, Dirección General de Vida Silvestre of Secretaría del Medio Ambiente y Recursos Naturales, México D.F., Mexico. We thank the numerous students who joined PMBG during his surveys. We are especially grateful to Raymundo Mineros-Ramírez, Dulce M. Noriega-Flores, N. Gabriela Blanco-Campos (Chetumal, Mexico), and Linda Mogk (Frankfurt am Main, Germany) for helping to process the collected specimens. We thank Noemí Salas Suárez, Eduardo R. Chamé Vázquez and Ruben A. Carbajal-Márquez for their help with the identification of arthropod and mammal remains from the snakes' gastrointestinal tract. Finally, we thank the earlier reviewers for the comments they provided for previous sections of the survey, as well as Louis W. Porras for helpful comments and corrections on the manuscript.

Literature Cited

Campbell, J. A. 1998. Amphibians and Reptiles of Northern Guatemala, the Yucatán, and Belize. University of Oklahoma Press, Norman, Oklahoma, United States.

Köhler, G., J. R. Cedeño-Vázquez, and P. M. Beutelspacher-García. 2016a. The Chetumal Snake Census: generating biological data from road-killed snakes. Part 1. Introduction and identification key to the snakes of southern Quintana Roo, Mexico. Mesoamerican Herpetology 3: 670–687.

Köhler, G., J. R. Cedeño-Vázquez, T. Kirstein, and P. M. Beutelspacher-García. 2016b. The Chetumal Snake Census: generating biological data from road-killed snakes. Part 2. *Dipsas brevifacies*, *Sibon sanniolus*, and *Tropidodipsas sartorii*. Mesoamerican Herpetology 3: 689–705.

Köhler, G., J. R. Cedeño-Vázquez, M. Spaeth, and P. M. Beutelspacher-García. 2016c. The Chetumal Snake Census: generating biological data from road-killed snakes. Part 3. *Leptodeira frenata*, *Ninia sebae*, and *Micrurus diastema*. Mesoamerican Herpetology 3: 930–947.

Köhler, G., J. R. Cedeño-Vázquez, A. Myat Tun, and P. M. Beutelspacher-García. 2017. The Chetumal Snake Census: generating biological data from road-killed snakes. Part 4. *Coniophanes imperialis*, *C. meridanus* and *C. schmidti*. Mesoamerican Herpetology 4: 528–542.

Lee, J. C. 1996. The Amphibians and Reptiles of the Yucatán Peninsula. Comstock Publishing Associates, Cornell University Press, Ithaca, New York, United States.

McCranie, J. R. 2011. The Snakes of Honduras: Systematics, Distribution, and Conservation. Contributions to Herpetology, Volume 26, Society for the Study of Amphibians and Reptiles, Ithaca, New York, United States.

Ruane, S., R. W. Bryson, Jr., R. A. Pyron, and F. T. Burbrink 2014. Coalescent species delimitation in Milksnakes (genus *Lampropeltis*) and impacts on phylogenetic comparative analyses. Systematic Biology 63: 231–250.

Appendix 1. Specimens examined.

Imantodes tenuissimus.—**MEXICO:** QUINTANA ROO: between Calderitas and Ruinas de Oxtankah: ECO-CH-H 3460, 4066, SMF 103695, 103701; between Calderitas and turn to Laguna Guerrero: ECO-CH-H 3853, SMF 99614, 100328, 100540, 103694, 103696; between Laguna Guerrero and turn to Calderitas: ECO-CH-H 3206, 3373, 3448, 3481, 3594, 3701, 3708, 3974, SMF 100542-43, 103698, 103700; between Luis Echeverría and Ruinas de Oxtankah: ECO-CH-H 3714, SMF 100544, 103699; between Luis Echeverría and turn to Laguna Guerrero: ECO-CH-H 3205, 3705, SMF 103697.

Lampropeltis triangulum.—**MEXICO:** QUINTANA ROO: between Calderitas and Ruinas de Oxtankah: ECO-CH-H 2920, 3970; between Calderitas and turn to Laguna Guerrero: ECO-CH-H 2919, SMF 100545, 100547-48; between Laguna Guerrero and turn to Calderitas: ECO-CH-H 3057, SMF 100546; between Luis Echeverría and turn to Laguna Guerrero: ECO-CH-H 3388, 3501; village of Laguna Guerrero: SMF 103693.

Stenorrhina freminvillii.—**MEXICO:** QUINTANA ROO: between Calderitas and turn to Laguna Guerrero: ECO-CH-H 3520, 3607, 3688, 3831, SMF 100694-95, 103680-81; between Laguna Guerrero and turn to Calderitas: ECO-CH-H 3188, 3408, 4068, SMF 103679, 103682; between Luis Echeverría and Ruinas de Oxtankah: ECO-CH-H 3599, 3684.

Gunther Köhler received a degree in Veterinary Medicine (Staatsexamen) at the University Gießen, Germany, in 1993, and a Doctoral degree at Goethe University Frankfurt am Main, Germany, in 1995; since that time, he has been the Curator of Herpetology at the Senckenberg Research Institute, Frankfurt am Main, Germany. Since 2017 he is also professor at Goethe University, Frankfurt am Main, Germany. His research focuses on the Neotropical herpetofauna, and for three decades he has conducted fieldwork in Central and South America, Mexico, and more recently in the Antilles. To date, Gunther has authored or co-authored 27 books and 218 research papers on amphibians and reptiles.

José Rogelio Cedeño-Vázquez completed his Licenciatura in biology at the Universidad Michoacana de San Nicolás de Hidalgo, Morelia, Michoacán, Mexico in 1995, and received his Master's and Doctoral degrees at El Colegio de la Frontera Sur (ECOSUR) in 2002 and 2008, respectively. From 1996 to 2000 he collaborated in several research projects in the Yucatan Peninsula. He was a researcher and instructor in the school of Biology at the Instituto Tecnológico de Chetumal, Quintana Roo, Mexico from 2008 to 2012, and since 2013 he is professor and researcher in the Departamento de Sistemática y Ecología Acuática at ECOSUR Unidad Chetumal; he also is the Curator of Herpetology at the Museo de Zoología of ECOSUR. Rogelio is interested in the systematics, ecology, conservation, and management of amphibians and reptiles from the Yucatan Peninsula, and to date has co-authored a book, several book chapters, research notes, and scientific and popular articles. He is a member of the Sistema Nacional de Investigadores (National System of Researchers), of Mexican herpetological associations, and of the IUCN/SSC-Amphibian and Crocodile Specialist Group.

Pablo M. Beutelspacher-García is an independent researcher. Although Pablo did not pursue a professional career, he is a born naturalist with huge empirical knowledge on the herpetofauna of the Yucatan Peninsula. Pablo's curiosity and passion for reptiles (especially snakes) arose in childhood, when he began making detailed observations on their behavior in order to distinguish between facts and myths. He has collaborated with researchers from El Colegio de la Frontera Sur, Chetumal, Quintana Roo, Mexico, in several research projects involving biodiversity inventories in Campeche, Quintana Roo, and Yucatán, Mexico, and also has co-authored technical reports, and several distribution and natural history notes on amphibians and reptiles.

Juan Alonso Domínguez-Lepe is a secondary school graduate who currently is employed at the Jardín Zoológico Payo Obispo, where he has worked for nine years in the section of reptiles (2007–2011) and mammals (ungulates; 2014 to date). Juan Alonso is interested in natural history aspects of reptiles, and particularly is fascinated with their variety of shapes and colors, as well as venom toxicity.

Elias Darius Kraus is a student at the "University of Technology and Economics" in Dresden (Germany) where he studies "Environmental-Monitoring." For an internship he works under the supervision of Gunther Köhler on various projects on the taxonomy of lizards and snakes at the Senckenberg Research Institute, Frankfurt am Main, Germany. He is very interested in zoology, and especially in herpetology.