

SCIENTIFIC NOTE

**THE RED IMPORTED FIRE ANT IS NOW IN MEXICO:
DOCUMENTATION OF ITS WIDE DISTRIBUTION
ALONG THE TEXAS-MEXICO BORDER¹**Sergio R. Sánchez-Peña,^{2,3} Richard J. W. Patrock,³ and Lawrence A. Gilbert³

Over the last decade, the red imported fire ant, *Solenopsis invicta* Buren has proven itself a cosmopolitan pest. Confined to central South America until its invasion of the United States around 1930, this species has since tramped its way around the Caribbean from Puerto Rico to Trinidad (Davis et al., 2001) and is now well ensconced along the Western Pacific rim in Brisbane, Australia (Moloney and Vanderwoude 2002), Malaysia (Na and Lee 2001), Taiwan (Yu-Tzu 2004), Hong Kong, Macao and the Guandong Province of southern China (Anon. 2005). Despite this globetrotting, *S. invicta* had failed to cross from Texas into Mexico across the slender Rio Grande since it was first found in counties bordering the river in 1991 (Allen et al., 1993). Here we report our finding of populations that have made the jump across the Rio Grande into Mexico. In 2001, one of us (RJWP) found *S. invicta* within meters of the Rio Grande in the southmost area of Brownsville, Texas. In 2004, S. R. Sánchez-Peña surveyed Mexican sites that spanned from the Colombia, Nuevo León (NL) border crossing point to the Playa Bagdad beach (Tamaulipas) on the Gulf of Mexico. Samples were also taken along major highways running south from the border to Monterrey, NL. Urban areas and towns searched included Colombia, Monterrey, Guadalupe, Cadereyta, General Bravo, the Sabinas Hidalgo toll road station, Cerralvo and General Treviño; all in NL; and Nuevo Laredo, Ciudad Mier, Miguel Alemán, Diaz Ordaz, Valadeces, Reynosa, Rio Bravo, Empalme, and Matamoros; all in Tamaulipas. Additional points were searched in between these towns. All points are in two vegetational areas: the South Texas or Rio Grande Plains and the Gulf prairies and marshes; the first is part of the Tamaulipan Biotic Province. Average annual rainfall ranges from 43 to 76 cm, increasing from West to East (Everitt and Drawe 1993). The proportion of Neotropical elements in the vegetation increases rapidly to the South, especially near the coast. Fire ants in general and *S. invicta* in particular are markedly anthropophilic, and readily invade moist, disturbed areas. Therefore, searches were directed towards the preferred habitats colonized by *S. invicta*: managed and artificial pastureland, watering holes, landscaped areas, squares (plazas) and gardens, parks, sidewalks, nurs-

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eries, greenhouses, junk yards, parking lots, edges of agricultural fields, road sides, restaurants, clearings in general, and flooded areas.

More than 800 *Solenopsis* samples were collected across the surveyed area. We made directed searches and baiting. Baits (pieces of oil-canned tuna or hot-dog) were placed on foraging grounds of *Solenopsis* spp., attracting tens of foragers of different sizes. When aboveground nests (mounds) were observed, we also collected workers by disturbing those mounds, causing workers to rush out aggressively. Sexuials were collected when present from these nests. Queens (wingless foundresses) were also collected on the ground after mating flights. Ants were preserved in 96% ethanol.

Most samples correspond to non-*S. invicta* fire ants. The only places where *S. invicta* was detected are as follows: SRSP collected this pest in four points in Tamaulipas, one colony in the vicinity of the Nuevo Laredo International Crossing II (N 27° 29' 46.4", W 99° 29' 36.0") and at three locations in Matamoros. Of these, two collections were determined from single colonies (N 25° 53' 40.5", W 097° 29' 51.9") and (N 25° 52' 24.9", W 097° 28' 19.6"), and a third was an infestation of about two hectares (N 25° 52' 09.2", W 097° 24' 24.4", and N 25° 51' 34.7", W 097° 24' 33.6") across from the southernmost area of Brownsville (Fig. 1). An additional population about 500 km NW was found by a collaborator in Ciudad Acuña, Coahuila, across the border from Del Rio, Texas, in February 2005. Voucher specimens are kept at the Entomology Collections of Brackenridge Field Laboratory, University of Texas at Austin and the Universidad Autónoma Agraria Antonio Narro, in Saltillo.

Solenopsis invicta does not appear to be ubiquitous on this section of the Mexican side of the border. Phillips and Thorvilson (1993) hypothesized that the most likely window for invasion of this pest into Mexico would be through Tamaulipas because of this area's extensive irrigated agriculture. Once in Mexico, they envisioned that *S. invicta* would be able to propagate along the Gulf coast before its populations spread to more mesic, central sections of the country. This path of range extension has been theoretically validated in a model by Morrison et al. (2004), in a work that suggests this route might be the only one available to imported fire ants for unaided movement into much of Mexico. Now that *S. invicta* has made the first step, we suggest it is important to implement eradication procedures of these small-localized populations; the longer this ant resides in Mexico the higher the chance of human-aided transport to the interior. We therefore encourage more extensive monitoring of the most likely zones of invasion and considering steps that will reduce the likelihood of accidental transport of *S. invicta* further south. Care should be taken not to disrupt native ant populations and the resistance they provide in stemming *S. invicta* establishment (Rao and Vinson 2004).

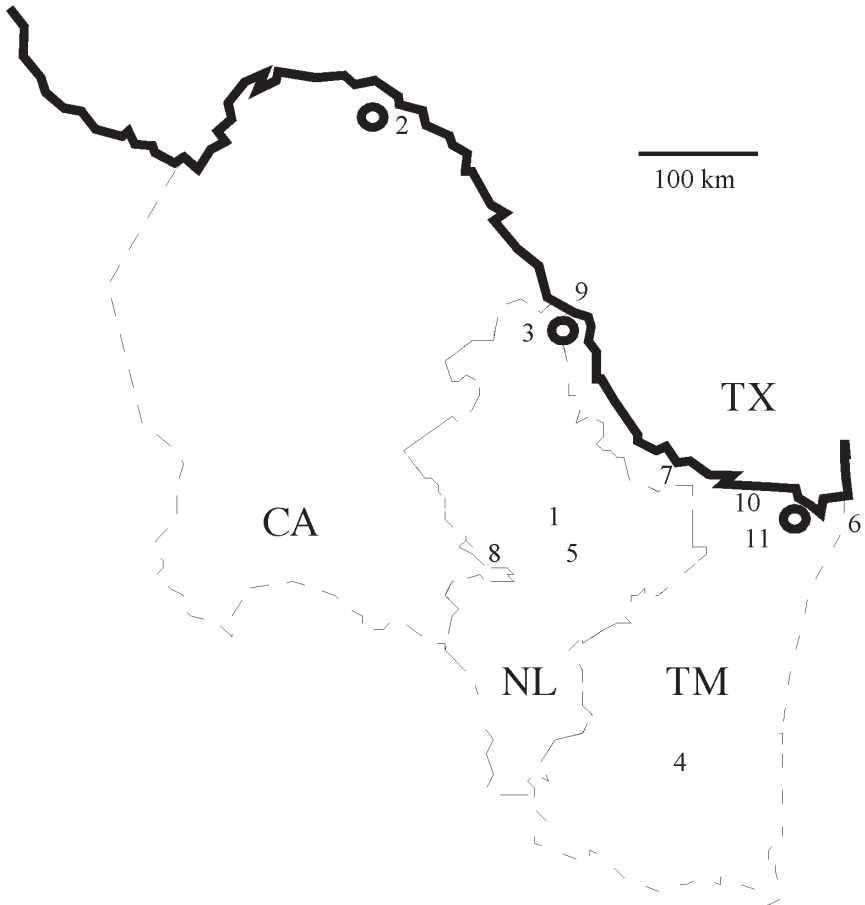


Fig. 1. Main collecting sites for *Solenopsis* spp. in northeastern Mexico. Sites where *Solenopsis invicta* was collected are marked with a circle **O**. All sites are located in Mexico. Locality 4, El Cielo Biosphere Reserve, is noted for its notoriously high biodiversity. Key to locations: 1 Cerralvo, 2 Ciudad Acuña, 3 Colombia, 4 El Cielo Biosphere Reserve, 5 G. Bravo, 6 Matamoros, 7 Miguel Alemán, 8 Monterrey, 9 Nuevo Laredo, 10 Reynosa, 11 Rio Bravo. Abbreviation of the Mexican states follows: Coahuila (CA), Nuevo León (NL), and Tamaulipas (TM). Texas (U.S.A.) is abbreviated TX. The map was drawn using ArcView.

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LITERATURE CITED

- Allen, C. R., S. A. Phillips Jr., and M. R. Trostle.** 1993. Range expansion by the ecologically disruptive red imported fire ant into the Texas Rio Grande Valley. *Southwestern Entomologist* 18: 315-316.
- Anon.** 2005. Red Fire Ant Sting Sends Villagers to Hospital. *China Daily, Hong Kong*. Jan. 26, p. 1.
- Davis, L. R., R. K. Vander Meer, and S. D. Porter.** 2001. Red imported fire ants expand their range across the West Indies. *Florida Entomologist* 84: 735-736.
- Everitt, J. H. and D. L. Drawe.** 1993. *Trees, shrubs and cacti of South Texas*. Texas Tech University Press. Lubbock, Texas, U.S.A. 214 pp.
- Moloney, S. and C. Vanderwoude.** 2002. Red imported fire ants: A threat to eastern Australia's wildlife? *Ecological Management and Restoration* 3: 167-175.
- Morrison, L. W., S. D. Porter, E. Daniels, and M. D. Korzukhin.** 2004. Potential global range expansion of the invasive fire ant, *Solenopsis invicta*. *Biological Invasions* 6: 183-191.
- Na, J. P. S. and C. Y. Lee.** 2001. Identification key to common urban pest ants in Malaysia. *Tropical Biomedicine* 18: 1-17.
- Phillips, S. A. J. and H. G. Thorvilson.** 1993. The red imported fire ant: Prospect for the invasion of Mexico. *Revista Biotam* 5 (2): 27-28.
- Rao, A. and S. B. Vinson.** 2004. Ability of resident ants to destruct small colonies of *Solenopsis invicta* (Hymenoptera: Formicidae). *Environmental Entomology* 33: 587-598.
- Yu-Tzu, C.** 2004. Agencies will collaborate to control outside species. *Taipei Times*. Taipei, Taiwan. May 2, p. 2.