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The Surinam Cockroach, *Pycnoscelus surinamensis* (Linnaeus, 1758) (Insecta, Blattodea, Blaberidae) in Mexico: new records with the help of citizen science

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Abstract. *Pycnoscelus surinamensis* (Linnaeus, 1758), Surinam Cockroach, is considered introduced to the Western Hemisphere, where it is a species of commercial and veterinary importance. In Mexico, *P. surinamensis* has been recorded from 17 states, and we newly report it in the states of Campeche, Michoacán, Puebla, and Querétaro, as well as the Ciudad de México, based on the examination of 184 specimens deposited in scientific collections. We also report it from the states of Aguascalientes, Baja California, Chihuahua, Estado de México, Guanajuato, Hidalgo, Sonora, and Tabasco based on our review of 952 photographic records from the citizen-science platform iNaturalist.

Key words. Blattodean, cosmopolitan species, introduced species, parasite, pest species, Pycnoscelinae, veterinary importance

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INTRODUCTION

The family Blaberidae comprises around 1,300 species of live-bearing cockroaches that usually have compact bodies and very short cerci which may sometimes appear absent. This family is very variable in its overall morphology, size, and lifestyle (Djernæs 2018). It is represented in continental North America by 16 genera (Atkinson et al. 1991; Estrada-Álvarez 2013; Paiero and Marshall 2014). Particularly, the genus *Pycnoscelus* Scudder, 1862, which is native of Southeast Asia, is present in all the countries of North America (Canada, Mexico, and the USA). One of its species, *Pycnoscelus surinamensis* (Linnaeus, 1758), Surinam Cockroach (Figure 1A, B), is a synanthropic invader and is considered cosmopolitan. It is an excellent colonizer that readily becomes established in new locations via the introduction of a single female (Roth 1998; Bell et al. 2007).

In Mexico, *P. surinamensis* has been recorded from 17 states: Baja California Sur (Hebard 1921; Palacios and Jiménez 1997); Chiapas (Fisk 1977; Reddell 1981; Palacios-Vargas et al. 2015); Coahuila (Cueto-Medina et al. 2015; Hernández-Rodríguez et al. 2013a, 2013b, 2014, 2015, 2016); Colima (Roth 1998); Durango (Arevalo-Arriaga 2012); Guerrero (Roth 1998); Jalisco (Hebard 1921; Cupul-Magaña et al. 2016); Morelos (Hoffman et al. 1986; Estrada-Álvarez and Guadarrama 2013; Núñez-Bazán et al. 2021); Nayarit (Ramírez-Olvera 1999); Nuevo León (Santoyo-de-Estéfano et al. 2014); Oaxaca (Hebard 1932); Quintana Roo (Lucio-Palacio and Noh-Gómez 2023); San Luis Potosí (Hebard 1932; Reddell 1981); Sinaloa (Hebard 1922); Tamaulipas (Reddell and Mitchell 1971); Veracruz (Saussure 1864; Walker 1868; Rehn 1902; Caudell 1914; Hebard 1921; Roth 1998); and Yucatan (Rehn 1902).

Pycnoscelus surinamensis is thought to have originated in the Indo-Pacific region, although its specific epithet implies another origin, Suriname. Populations of this species are made up almost entirely of thelytokous parthenogenetic females, although infertile males are produced, albeit extremely rarely (Roth 1967). Bisexual populations originally thought to belong to this taxon were elevated to species status as *Pycnoscelus indicus* (Fabricius, 1775), the sister lineage from which *P. surinamensis* arose (Roth 1967; Wang et al. 2025).

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This species is considered economically important as it can become a pest in greenhouses and plantations (Schwabe 1949; Roth and Willis 1960; Bell et al. 2007). Roth and Willis (1960) reported damage to several species of plants, and in some cases, it was as extensive as 30,000 to 300,000 individual plants destroyed. *Pycnoscelus surinamensis* is of veterinary importance as, alongside *P. indicus*, these two species are the only known intermediate hosts of the nematode *Oxyspiura mansoni* (Cobbold, 1879) (Spirurida, Thelaziidae), a parasite whose adults reside in the eyes of various birds, including domestic chickens (Schwabe 1949; Rodríguez-Tovar et al. 2008; Santoyo-de-Estéfano et al. 2014).

Here, we newly report *P. surinamensis* from several states in Mexico based on our examination of 184 specimens in entomological collections, as well as 952 research-grade observations from the citizen science platform iNaturalist. These data expand the knowledge of the distribution of this introduced insect in the country.

METHODS

Revision of specimens in collections. During a visit in June 2023 to the Colección Nacional de Insectos (CNIN) of the Universidad Nacional Autónoma de México, cockroach specimens deposited there were examined, and 51 specimens of *P. surinamensis* were found. Additionally, 42 specimens of *P. surinamensis* from the Laboratorio de Entomología of the Facultad de Ciencias Forestales (FCF) of the Universidad Autónoma de Nuevo León (UANL), 18 from the Colección Nacional de Insectos "Dr. Alfredo Barrera Marín, Museo de Historia Natural de la Ciudad de México, Chapultepec, CDMX, México (CNIABM), 15 from the Entomological Collection of Entomological Research (ER) and 58 from the American Museum of Natural History (AMNH) (Johnson et al. 2023) were also consulted.

Observations in iNaturalist. Mexican records in iNaturalist (2025) were reviewed on 28 February 2025. Blattodea records in general were checked. From those, observations of *P. surinamensis* were selected and identifications manually corroborated by examining the morphology and color patterns. Although *P. surinamensis* is somewhat variable in its coloration, both adults and nymphs are easily recognized from other North American cockroaches, even only from photographs. This makes *P. surinamensis* an ideal candidate to be monitored through citizen-science applications such as iNaturalist (see Identification below). Each of the confirmed iNaturalist records were marked as "research-grade" observations in the platform. Both adults and juveniles were included in our study. The map showing the distribution of the species in Mexico was made using SimpleMappr (Shorthouse 2010).

RESULTS

Order Blattodea Brunner von Wattenwyl, 1882
Family Blaberidae Saussure, 1865
Genus *Pycnoscelus* Scudder, 1862

***Pycnoscelus surinamensis* (Linnaeus, 1758)**
Figures 1, 2

Material examined. MEXICO — Baja California Sur • Lower California between San Jose del Cabo and Triunfo, Albatross Expedition; 1911; 5 ♀ and 19 juv., AMNH — Campeche • Champotón, El Zapote; 19.VI.1989; A. Cárdenas, L. Cervántes leg.; 1 ♀, UNAM-CNIN, PycSu001 • Bolano H.O.N. de Rejón; 21.VI.1986; F. Arias leg.; 1 ♀, UNAM-CNIN, PycSu002 — Chiapas • Huixtla; 8.VIII.1941; 1 juv., UNAM-CNIN, PycSu002 • Acapetahua; 17.IV1980; B. Melendes leg.; 1 ♀, UNAM-CNIN, PycSu003 • Río Monte Tapachula; 18.IX.1985; M. Vertiz leg.; 1 juv., UNAM-CNIN, PycSu004 — Ciudad de México • 5.X.1978; E. Marino leg.; 1 juv., UNAM-CNIN, PycSu005 • Del. Benito Juarez; 12.VIII.2006; A. Ibañez leg.; 1 juv., CNIABM 363-15 • 8.V.1968; A. Barrera leg.; 1 juv., CNIABM 363-16 — Colima • Isla Clarión; VII-XII.1987; E. Barrera leg.; 10 ♀, UNAM-CNIN, PycSu006–PycSu016 — Durango • San Juan de Guadalupe, San Juan de Guadalupe; 27.IX.2022; R. Nuñez-Bazán; 4♀, ER Pyc001-Pyc004 — Guerrero • Cocula, Guerrero; 17.II.1968; Q.B.P leg.; 1 juv., CNIABM 363-17 • Omiltemi, 1400 m a.s.l.; 16.V.1971; M. Cortés leg.; 1 juv., CNIABM 365-8 — Jalisco • Estación Biológica Chamela, 19°29′55.18″N, 105°02′39.26″W, 99 m a.s.l., 5–7.IX.2009; A. Zaldívar and H. Clebsch leg.; 1 ♀, UNAM-CNIN PycSu017 • Chamela; 5.XII.1976; Harry Brailovsky leg.; 1 ♀, UNAM-CNIN PycSu018 • Estación Biológica Chamela, La Huerta, Escolar Santa Cruz; 19°35′54.54″N, 105°02′55.43″W; 31.V.2022; A. Zaldívar and P. Benítez leg.; 1 ♀, UNAM-CNIN PycSu019 • 1 mile SW of "La Resolana"; 20.X.1950; Ray F. Smith leg.; 2 juv, AMNH • Ajijic; 20.VI.1968; G. y V. Halffter y P. Reyes leg.; 2 ♀, CNIABM 363-21, 363-22 — Michoacán • Morelia, Cerro Punhuato; 23.VIII.2014; López-López leg.; 1 ♀, UNAM-CNIN PycSu020 — Morelos • Xochitepec; 10.VII.1955; V. Guzmán leg.; 1 ♀, CNIABM 39160 • Teques-

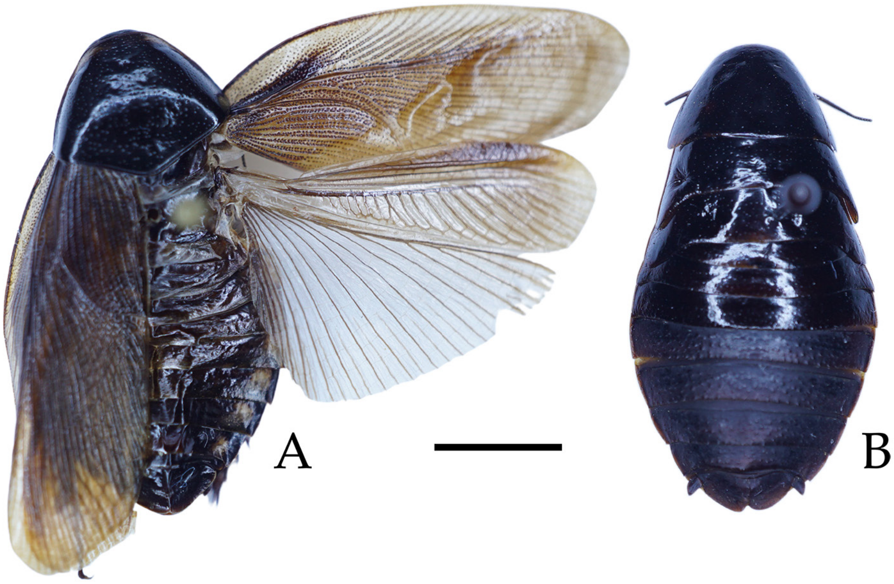

Figure 1. *Pycnoscelus surinamensis* from Nuevo León, Mexico. **A.** Dorsal aspect of adult female with right tegmina and wing extended; abdomen shrunken due to being dried, making the wings and tegmina to appear longer. **B.** Dorsal aspect of subadult nymph. Scale bar: 5 mm.

quitenco; 5.IV.1969; Ma. T. Galván leg.; 1 ♀, CNIABM 365-7 • Loma Bonita, Cuernavaca; XI.2021; R. Núñez-Bazán leg.; 3 ♀, ER Pyc005-Pyc007 • Totolapan; 22.X.2023; J. Ramos leg.; 8 juv, ER Pyc008-Pyc015 — Nayarit • Isla María Magdalena, acueducto; 23.XI.1986; V. Melendez leg.; 1 juv., UNAM-CNIN PycSu021 • Río Santiago Colorado de la Mora, Arroyo Los Negros; 28.XI.1991; R. Barba and E. Barrera leg; 1 ♀, UNAM-CNIN PycSu022 • San Blas; 4–5.VIII.1947; B. Malkin leg.; 2 ♀, 4 juv, AMNH — Nuevo León • García; VII.1910; 1 ♀, UNAM-CNIN PycSu023 • Ciudad Universitaria, San Nicolás de los Garza; 13.I.2020, Roberto García-Barrios leg.; 2 ♀ and 5 juv., FCF-BLATT021 • Facultad de Ciencias Forestales UANL, Linares; 15.I.2021; Manuel de Luna leg.; 1 ♀, 4 juv., FCF-BLATT024 • Panteón Municipal, Santa Catarina; Manuel de Luna leg.; 1 ♀, FCF-BLATT028 • Cerro de la Silla (cascadas, Rincón de la Sierra), Guadalupe; 2018; Manuel de Luna leg.; 2 ♀, FCF-BLATT107 — Oaxaca • Huatulco; 28.IX–11.X.2021; A. Zaldívar and P. Benítez leg.; 1 ♀, UNAM-CNIN PycSu025 • Santa María Huatulco, predio FONATUR evento 3B, 15°43′51.2″N, 096°09′45.61″W; 31.VIII.2021; A. Zaldívar and P. Benítez leg.; 1 ♀, UNAM-CNIN PycSu026 • Huatulco, evento 1B, 15°43′38.68″N, 096°09′43.91″W; 21.VI–7.VII.2021; A. Zaldívar and P. Benítez leg.; 1 ♀, UNAM-CNIN PycSu027 • Tuxtepec; 11.I.1964; 1 ♀, UNAM-CNIN PycSu028 • Monteflor, Oaxaca; 1 ♀, UNAM-CNIN PycSu029 • Piedra Lumbre; 3.XI.1987; F. Arias leg.; 2 juv., UNAM-CNIN PycSu030, PycSu031 • San Geronimo; 5.II.1909; 1 ♀, AMNH • Tolosa; 23.VIII.1947; B. Malkin leg.; 1 ♀ and 2 juv., AMNH — Puebla • Villa Avila, Camacho; 24.I.1985; E. Marino leg.; 1 juv, UNAM-CNIN PycSu032 • Matamoros; 6.VII.1942; L. Vázquez leg.; 1 ♀, UNAM-CNIN PycSu033 • Cuetzalán; 26.X.2017; Jonathan Velazquez leg.; 1 ♀, UNAM-CNIN PycSu033 • Matamoros; 18.VII.1942; 1 ♀, UNAM-CNIN PycSu034 — Querétaro • Ciudad de Querétaro; 1–7.XI.2008; K.A. Brailovsky leg.; 1 ♀, UNAM-CNIN PycSu035 — Quintana Roo • Isla Mujeres, Quintana Roo; 16.V.1961; F. Aguilar leg.; 6 juv., CNIABM 39203-08 — San Luis Potosi • El Salto Sn. Luis Potosi, 400 m a.s.l.; 22.V.1944; C. Bolivar leg; 2♀, 1 juv., CNIABM PycSu036 • Tamazunchale; 17.VII.1946; J. & D. Pallister leg.; 2 ♀, AMNH — Sinaloa • Mazatlán; 16–31.XII.1946; J. A. Kusche leg.; 1 ♀, AMNH • Mazatlán; Hy. Edwards leg.; 1 ♀, AMNH — Tamaulipas • Cerro Bernal; 21.XII.1949; F. Biaggi leg.; 1 juv., UNAM-CNIN PycSu037 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 15.X.2020; Roberto García-Barrios leg.; 2 ♀ and 2 juv., FCF-BLATT011 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 15.VIII.2021; Manuel de Luna leg.; 1 ♀, FCF-BLATT017 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 15.VII.2021; Manuel de Luna leg.; 3 ♀, FCF-BLATT030 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 24.X.2020; Roberto García-Barrios leg., 1 ♀, FCF-BLATT077 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 15.VI.2021; Manuel de Luna leg.; 4 ♀, FCF-BLATT086 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 15.XI.2020; Manuel de Luna leg.; 1 ♀, FCF-BLATT106 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 15.XI.2020; Manuel de Luna leg.; 1 ♀, FCF-BLATT108 • Reserva de la Biósfera “El Cielo”, Gomez Farías; 15.VI. 2021; Manuel de Luna leg.; 8 ♀, FCF-BLATT143 — Veracruz • Huasteca Veracruzana; VIII.1958; 2 ♀, UNAM-CNIN PycSu038-PycSu039 • Estación de Biología Tropical “Los Tuxtlas”; 15.X.1985; E. Ramírez leg.; 1 ♀, UNAM-CNIN PycSu040 • Plan del Río; 1 ♀, UNAM-CNIN PycSu041 • Xalapa; 22.X.1983; J. Peña leg.; 1 juv., UNAM-CNIN PycSu042 • El Vigía, Santiago Tuxtla; 20.IX.1963; 6 juv., UNAM-CNIN PycSu043 • Ocotal Texisapa, 8.XII.1985, R. Barba leg.; 2 juv., UNAM-CNIN PycSu044 • Estación Biológica Tropical “Los Tuxtlas”, San Andrés Tuxtla, 25.VII.2022; Manuel de Luna leg.; 2 ♀ and 2 juv., FCF-BLATT054 • Jesus Carranza; VI.1944; M. Guerra leg.; 1 ♀, AMNH. • Dos Amates; 27.XI.1967; P. Reyes leg.; 2 juv., CNIABM 362-8, 362-9 — Yucatán • Uxman, 20°24′00.97″N, 089°47′53.4″W; 11.VI.1994; E. Barrera leg.; 1 ♀, UNAM-CNIN PycSu045 • Chichen Itza; 16.VII.1952 to 19.VIII.1952; J. & D. Pallister leg.; 7 ♀, AMNH • Chuminopolis; 7.VIII.1952; J. & D. Pallister leg.; 1 ♀, AMNH • Colonia Yucatán; 6.VIII.1952 and

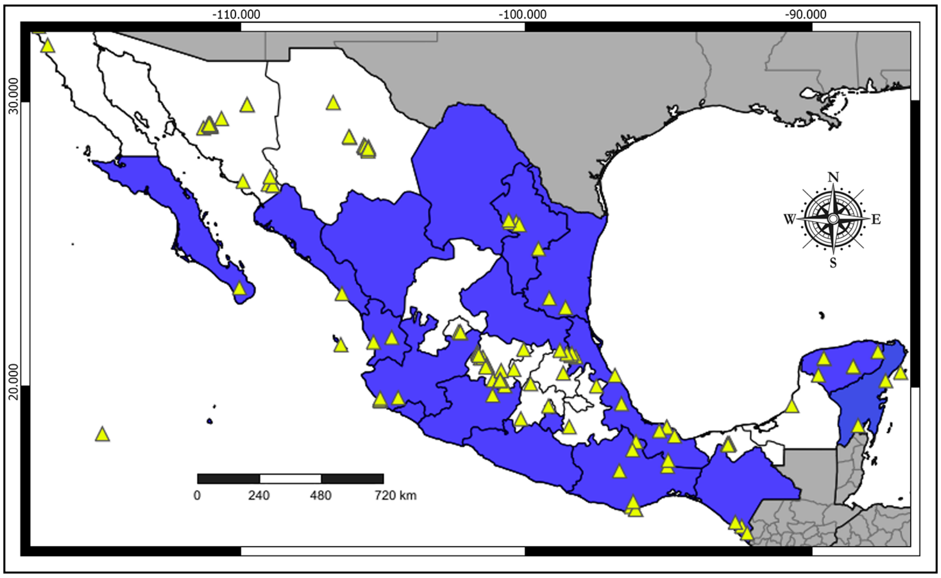

Figure 2. Distribution of *Pycnoscelus surinamensis* in Mexico. Records of the examined specimens and the photographic records are represented with yellow triangles. Blue-filled states denote the presence of this species as stated in previous literature records (see Introduction).

17.VIII.1952; colls. J. and D. Pallister leg.; 2 ♀, AMNH • Itzimna; 3–7.IX.1964; J. C. & D. Pallister leg.; 2 ♀ and 1 juv., AMNH • Chumihopilis; 20.VII.1964 and 8.VIII.1965; J. C. & D. Pallister leg.; 3 ♀, AMNH • Piste; 3–5.VI.1959; P. & C. Vaurie leg.; 1 ♀, AMNH.

iNaturalist observations. There were found 952 confirmed observations of *P. surinamensis* from Mexico in the platform, including seven from Aguascalientes, three from Baja California, 21 from Chihuahua, five from Estado de México, 25 from Guanajuato, 41 from Hidalgo, 22 from Sonora, and six from Tabasco. These constitute additional new state records. No records were found in the states of Tlaxcala and Zacatecas. See Supplementary file.

Identification. We based our identifications on the works of Roth (1967, 1998), Helfer (1987), Anisyutkin (2002, 2018), Choate (1998), and Lucio-Palacio and Noh-Gómez (2023), as well as the examination of a large series of specimens in the CNIN-UNAM and the FCF-UANL collections. This is a medium-sized cockroach (up to 3.23 cm in total length) with discreet coloration. The pronotum is black, with the anterior margin having yellow or cream-colored tinges; these can take the form of a band and extend to the lateral margins (Lucio-Palacio and Noh-Gómez 2023), be reduced (Figure 1A), or even be absent in melanistic individuals. Tegmina are typically light brown or ochre, with the proximal portion of the costal region usually being lighter than the rest (Figure 1A); in melanistic individuals the tegmina are completely black. The hindwings are dull brown and subhyaline (Figure 1A). The tergites are mostly black and very shiny, and these can have a yellow anterior margin, as well as yellow lateral patterns (Figure 1A), but this is variable; in melanistic individuals the terguites can be completely black. Both sexes have the same coloration and overall morphology, but most often only females can be found, as infertile males are exceedingly rare. Males have an asymmetrical subgenital plate and tegmina and wings which noticeably surpass the abdominal apex. The combination of these characteristics set *Pycnoscelus* apart from the rest of the North American Blaberidae. Nymphs are black (reddish brown in old, dried specimens), concolorous, and ostensibly shiny, except for the last four tergites and the supra-anal plate, which are opaque and roughened (Figure 1B) and often accumulating debris. This last character sets the nymphs of *P. surinamensis* apart from those of *Nauphoeta* Burmeister, 1838 and *Panchlora* Burmeister, 1838, which have similar morphology.

DISCUSSION

Pycnoscelus surinamensis had been reported in Mexico from 17 states (see Introduction). With the new records, it is now also recorded from Aguascalientes, Baja California, Campeche, Chihuahua, Ciudad de México, Estado de México, Guanajuato, Hidalgo, Michoacán, Puebla, Querétaro, Sonora and Tabasco. The only Mexican states without records of this species are Tlaxcala and Zacatecas. As has been recently explored with other polyneopterans (Estrada-Álvarez et al. 2023; de Luna et al. 2023), the use of citizen-science records proves to be extremely useful in filling knowledge gaps in the distribution of *P. surinamensis* in Mexico, and these observations are very important information for supplementing museum specimens. In this study, the records of *P. surinamensis* from Aguascalientes, Baja California, Chihuahua, Estado de México, Guanajuato, Hidalgo, Sonora and Tabasco were obtained exclusively from iNaturalist.

Currently, *P. surinamensis* does not figure as an invasive species in Mexico (DOF 2016; Lucio-Palacio and Noh-Gómez 2023); however, this must certainly be changed, as it has been proven to be a vector of a parasite with commercial and ecological importance and can deal hefty damage to both ornamental plants and crops. It also spreads very easily by parthenogenetic reproduction. All these characteristics make it a serious threat wherever it is introduced.

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: JCEA, MdL, RNB. Data curation: RGB. Formal analysis: MdL, RGB. Funding acquisition: JCEA, MdL, IAHD, GCR. Investigation: JCEA, MdL, RNB. Methodology: JCEA. Project administration: JCEA, MdL, RNB. Software: MdL. Resources: MdL, IAHD. Supervision: IAHD. Validation: MdL, JCEA, RNB. Writing – original draft: MdL. Writing – review & editing: MdL, JCEA, RNB, RGB, IAHD.

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Data availability

All data that support the findings of this study are available in the main text.

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