

Review of the Neotropical Genus *Toonglasa* (Hemiptera: Lygaeidae)¹

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ABSTRACT *Toonglasa forficuloides* Distant is reported for the first time since its original description from a single specimen in 1893. Its host plant and habitat are discussed, and descriptions are given of the adult and nymph. The relationships of *Toonglasa* Distant to *Extarademus* Slater and Wilcox are discussed, and the latter is reduced to junior synonymy. A key is given to distinguish the species of *Toonglasa*. The host plant relationships of several members of the genus are discussed, and several Mexican species (including *forficuloides*) are established as breeding on species of bamboos. *Toonglasa barrerai*, *T. thackstonae*, and *T. yushaniacola* are described as new species from Mexico. New locality data are given. The 5th instars of *T. tumorosis*, *T. collaroides*, and *T. umbratus* are described. Figures include dorsal views, lateral and ventral views of details of the abdomen, pygophores, parameres, sperm reservoirs, and habitat photographs for a number of species.

Toonglasa forficuloides was originally described as monotype of *Toonglasa* by Distant (1893) from a single male collected in Mexico from "omilteme in Guerrero 8,000 feet." It has remained until now known only from this single specimen.

Recently, H. Brailovsky and his associates discovered a breeding colony of the species, established the host plant, and obtained nymphs. We can now establish more definitely the systematic position of the genus and its relationship to *Extarademus* Slater and Wilcox.

Slater and Wilcox (1966) erected *Extarademus* for three species formerly included in *Ischnodemus*, (*macer* Van Duzee, *discalis* Barber, *collaris* Signoret), and described five new species. The genus was characterized principally by the males' usually having the caudo-lateral angles of the seventh lateral connexivum produced as acute spines; abdominal sterna 5, 6, and 7 usually bearing a series of sharp tubercular spines; an elongate narrow, anteriorly curving metathoracic scent gland auricle; and a single ventral spine distally on each fore femur. Slater (1979) defined the genus more succinctly by the sperm reservoir's having a "small often stalked cup and elongate, slender, diverging strap-like wings," and the extensive development of the SGA1 and SGA2 sclerites of the nymphs. (See Slater 1979 for code to abbreviations).

Toonglasa and *Extarademus* were noted by Slater (1979) to be closely related. Dissection of *T. forficuloides* shows the similarity of its sperm reservoir and its nymphal sclerotizations to those of *Extarademus*.

The two "genera" are synonymous. The sperm reservoirs, parameres, shape of the metathoracic scent gland auricle, and nymphal abdominal sclerotization all support this synonymy. The presence of spines on the seventh lateral connexivum and abdominal spiracles of males are not definitive, although they are useful supporting characters when present.

Toonglasa as used subsequently in the present paper includes species previously placed in *Extarademus*. The latter thus becomes a junior synonym.

Slater and Wilcox (1966) recognized two distinct components within *Extarademus* (= *Toonglasa*). Although *barrerai* and *thackstonae* spp. n. lack abdominal spines, they belong to the group containing *umbratus*, *tylosis*, and *tumorosis*. Indeed, *thackstonae* is extremely similar to *umbratus* (Distant) in size, shape, and pruinosity pattern. We have examined many specimens of *umbratus* from western Iowa through Mexico and Central America and into South America as far as Brazil, and every male has the characteristic series of sharp spines on abdominal sterna 5-7, as illustrated by Slater (see Fig. 8A in Slater [1979]).

T. forficuloides may be most closely related to *collaris* and *collaroides*. Its position within the genus is difficult to assess. The lack of ventral abdominal spines in the male suggests it may be related to the essentially sympatric *thackstonae* and *barrerai*. However, the lack of pruinosity and the strongly developed connexival projections suggest a *collaris*-group relationship.

Biology

The life cycle remains unknown for any species of *Toonglasa*. We have definite breeding records of three species (with a fourth species probable) on species of bamboos. Slater (1976) lists 19 blissine species (eight genera) associated with bamboo. However, only three Oriental species (two genera) have been established in the literature as breeding on bamboos, and only one of these bamboos has been identified. *Pirkimerus japonicus* (Hidaka), *Macropes pronotalis* (Distant), and at least three additional Oriental species of *Macropes*, definitely breed on bamboos. (Le-Yi Zheng, personal communication).

In the Western Hemisphere, three species of Blissinae have been reported on bamboos: *Riggiella vianai* Kormilev, *Caveloblissus americanus* Slater and Wilcox, and *Ischnodemus fulvipes* (De Geer). The first of these probably does breed on bamboos; the other two probably do not.

Thus, the present records constitute the first definite breeding records of Blissinae from bamboos in the Western Hemisphere.

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Species of *Toonglasia* that breed upon bamboos are not restricted to a single host. *T. forficuloides* has been taken breeding on *Bambusa chusque* Poirét (Fig. 13, 14, and 15), *Bambusa aculeata* (Rupr.) Hitchc. and *Yushania aztecorum* McClure-W. Smith. *T. yushanicola* occurs with *T. barrei* on *Yushania aztecorum*. *T. barrei* breeds on *Arthrostylidium longifolium* (Fourm.) E. G. Camus with *T. thackstonae*.

Toonglasia species are not all associated with bamboos. Slater (1976) reports *Toonglasia umbratus* (as *macer*) breeding on *Andropogon glomeratus* (Walt.) E. S. P. and *Bothriochloa intermedia* (R. Br.) A. Camus in Panama. Bralovsky has taken *umbratus* on *Hyparrhenia rufa* (Nees) Stapf. *T. humerus* was reported by Slater (1976) breeding on *Pennisetum purpureum* Schumacher in Panama. All these grasses belong to the Panicoideae (*Pennisetum* in the Paniceae, the others in the Andropogoneae). (All text measurements are in millimeters.)

Key to Species of *Toonglasia*

1. Pronotum in large part dull, pruinose in texture, never shining over entire dorsal surface..... 2
- 1a. Pronotum shining over entire dorsal surface..... 7
2. Tylus much broadened at anterior end to form splayed-out, truncate apex; males with pair of sharp spines projecting from ends of connexiva..... *tylosis* (Slater and Wilcox)
- 2a. Tylus narrow and of uniform width throughout (Fig. 16), never broadly splayed out and truncate at apex; males either with or without acute spines projecting from ends of abdominal connexiva..... 3
3. Second antennal segment relatively elongate, always more than 1.25 times interocular space..... 4
- 3a. Length of second antennal segment relatively short, never more than 1.2 times interocular space..... 5
4. Antennae uniformly black; large, robust species over 6 mm in length; males with raised median keel on sternum seven (Fig. 11) but lacking spinose tumid areas on sterna 5-7 and lacking acute posteriorly directed projections on 7th abdominal connexiva..... *yushanicola* n. sp.
- 4a. Antennal segments 1-3 light yellow; relatively small, slender species less than 6 mm in length; males lacking median keel on abdominal sternum 7 but with tumid spinose elevations on sterna 5-7 and sharply produced acute posteriorly directed spines projecting from 7th abdominal connexiva..... *tumorosis* Slater and Wilcox
5. Males with numerous sharp spines on abdominal sterna 5-7..... *umbratus* (Distant)
- 5a. Males lacking distinct acute spines on abdominal sterna 5-7..... 6
6. Labium subequal in length to pronotal length; eyes placed on short, broad "shell" (Fig. 16)..... *barrei* n. sp.
- 6a. Pronotal length greater than labial length; eyes sessile..... *thackstonae* n. sp.
7. Membrane with a large, distinct median dark discal spot (Cuba)..... *discalis* (Barber)
- 7a. Membrane often suffused, but lacking discal spot..... 8

8. Labium extremely short, extending only short distance onto prosternum, remote from fore coxae, with third labial segment not attaining base of head..... *humerus* (Slater and Wilcox)

8a. Labium more elongate, extending posteriorly almost to fore coxae, third labial segment considerably exceeding base of head..... 9

9. Extreme posterior portion of pronotum with very narrow marginal pruinose band, contrasting with shining area of rest of pronotum; males with hind femora strongly incrassate and bearing series of short spines near middle of ventral surface; metathoracic scent gland auricle relatively broad and ellipsoidal..... *mundus* (Slater and Wilcox)

9a. Pronotum completely shining even along extreme posterior margin; males with hind femora only moderately incrassate, unarmed below; metathoracic scent gland auricle elongate and slender..... 10

10. An elongate projection protruding from abdominal connexivum 7 (Fig. 12)..... *forficuloides* (Distant)

10a. No elongate lateral projection protruding from abdominal connexivum 7..... 11

11. Males with elongate median spine projecting from posterior margin of eighth sternum..... *collaris* (Signoret)

11a. Males lacking a projecting spine from posterior margin of eighth sternum, the latter with serrate edge and median bulge, but lacking a distinct spine..... *collaroides* (Slater and Wilcox)

Toonglasia forficuloides Distant (Fig. 1, 5, 10, 12, 13, 14, and 15)

Redescription of male. (See p. 17 in Slater [1979] for additional characters.) Body broad, strongly dorso-ventrally flattened. Dorsal and ventral surfaces completely shining, nonpruinose (Slater's statement [1979] that the head, pronotum, and scutellum have pruinose areas is in error. He was misled in his early manuscript redescription of the type by the covering of decumbent silvery hairs laterally on the head and scutellum and laterally and broadly across the transverse impression of the pronotum.) General coloration black as follows: head, except extreme apex of tylus; pronotum from anterior margin to posterior margin of transverse impression; scutellum; clavus; corium mesad of radius; greater portion of surface of membrane; thoracic pleura, sterna, and antennae. Apex of tylus, posterior pronotal lobe, margin of each claval from claval commissure, radius of corium, acetabula, coxae, and abdomen reddish to yellowish brown. Lateral margins of corium and membrane broadly pale yellow almost white. Membrane dark (Slater's Figure [1979] is in error), broadly margined with white, more narrowly so near apex. Legs a strongly contrasting, bright orange yellow.

Head nonconvexite, eyes sessile, set well away from antero-lateral pronotal angles, tylus extending to middle of first antennal segment. Length of head 0.98, width 1.05, interocular space 0.73. Pronotum with broad, complete transverse impression, lateral margins nearly straight from humeral angles to middle of anterior lobe, then arcuately narrowing to anterior margin, latter deeply

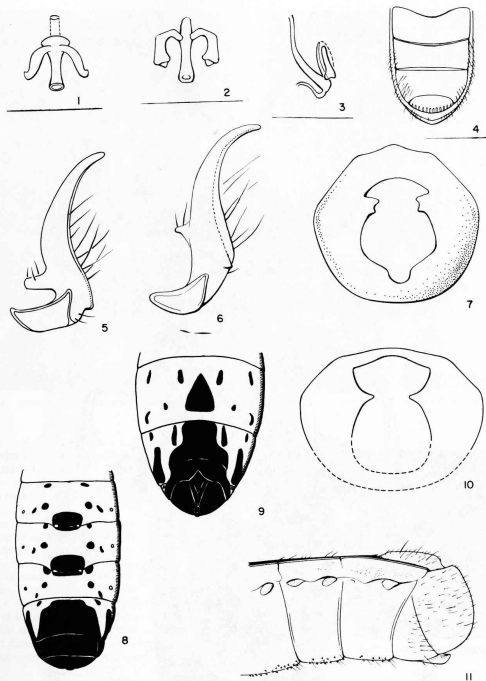


FIG. 1. *Toonglasia forficuloides* Distant. Sperm reservoir. Dorsal view.
 FIG. 2. *Toonglasia barrei* n. sp. Sperm reservoir. Dorsal view.
 FIG. 3. *Toonglasia barrei* n. sp. Sperm reservoir. Lateral view.
 FIG. 4. *Toonglasia forficuloides* Distant. Posterior abdominal segments. Ventral view.
 FIG. 5. *Toonglasia forficuloides* Distant. Paramere.
 FIG. 6. *Toonglasia barrei* n. sp. Paramere.
 FIG. 7. *Toonglasia barrei* n. sp. Pygophore. Dorsal view.
 FIG. 8. *Toonglasia umbratus* (Distant). Tergum of abdomen. 5th-instar nymph.
 FIG. 9. *Toonglasia umbratus* (Distant). Posterior abdominal segments of sternum. 5th-instar nymph.
 FIG. 10. *Toonglasia forficuloides* Distant. Pygophore. Dorsal view.
 FIG. 11. *Toonglasia yushanicola* n. sp. Posterior abdominal segments. Lateral view.

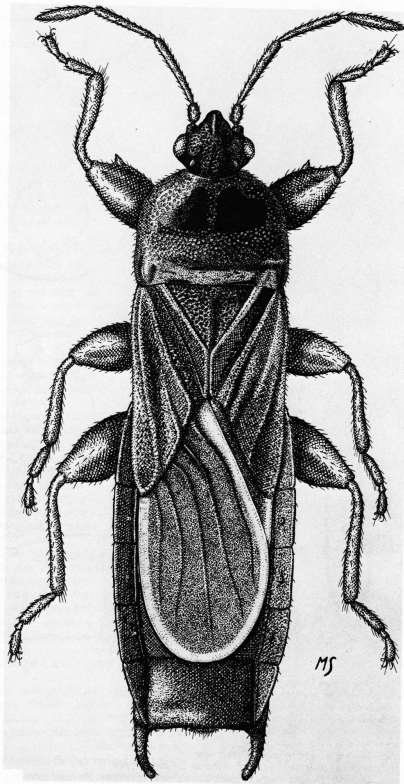


FIG. 12. *Toonglasia forficuloides* Distant. Dorsal view.



FIG. 13. *Toonglasia forficuloides* Distant. Habitat.



FIG. 14. *Toonglasia forficuloides* Distant. Closeup in sheath of *Bambusa chusque*.

concave. Length of pronotum 1.29, width 1.93. Scutellum with a distinct, complete median carina. Length of scutellum 0.78, width 1.10. Hemelytra with lateral corial margins slightly convex, membrane attaining anterior portion of abdominal tergum seven. Length of claval commissure 0.61; midline distance from apex of clavus to apex of corium 1.36; midline distance, apex of corium to apex of abdomen (not including terminal projections) 2.81. Metathoracic scent gland auricle elongate, nearly reaching lateral margin of body, broadened and curved anteriorly at distal end. All femora strongly incrassate. Fore femora with single large ventral spine. Labium reaching onto anterior portion of mesosternum. Length of labial segments I 0.72, II 0.68, III 0.81, IV 0.61. First antennal segment broad, obovate, segments two and three slender, slightly enlarged distally, segment four narrowly fusiform. Length of antennal segments I 0.32, II 1.00, III 0.85, IV 1.00. Total body length (exclusive of terminal spines) 6.88.

Pygophore with lateral margins of opening with single internal projection (Fig. 10). Paramere slender with acute angulate inner projection and large, "thumblike" outer projection (Fig. 5). Sperm reservoir slender, bulb broadened distally, wings slender and straplike (Fig. 1).

Female. Similar to male but lacking terminal projections. Ovipositor extending anteriorly to posterior margin of segment five.

Material examined. Mexico: Guerrero: 5 males, 3 females, 73 km from Iguala (Iguala-Cuernavaca Road),



FIG. 15. *Toonglasia forficuloides* Distant. Closeup of habitat.

30-I-82. 34 males, 26 females, 5 km from Chilpancingo (Chilpancingo-Omitlame Road), 29-I-82. (Coll. H. Brailovsky, E. Barrera, M. Garcia, A. Ibarra). In Instituto de Biología UNAM, Mexico D.F., and J. A. Slater collections.

Biology. The host plants of *Toonglasia forficuloides* are large bamboos such as *Bambusa chusque* Poiré (Fig. 13, 14, and 15). Specimens were taken on this plant at two localities. At the "5-km" locality, this bamboo was growing at 1,470 m on a stony mountainside. The plants

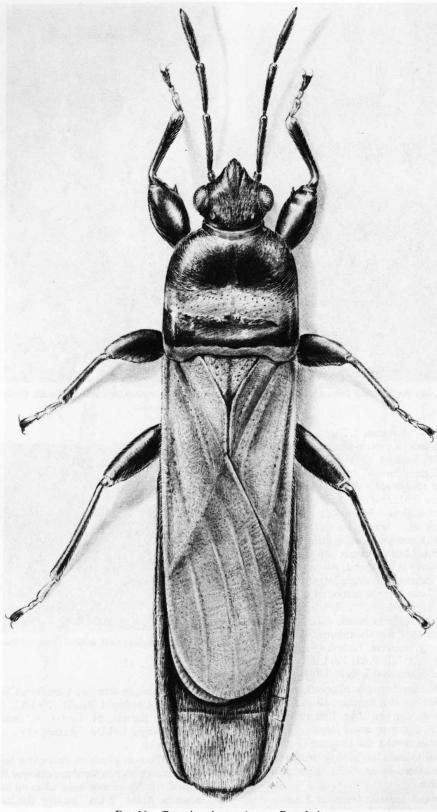
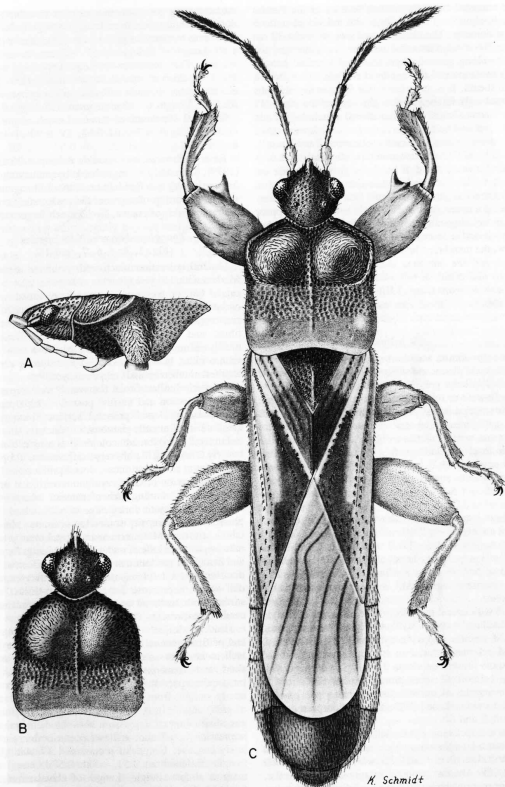


FIG. 16. *Toonglasia barrerai* n. sp. Dorsal view.



H. Schmidt

FIG. 17. (a) *Toonglasia humerus* (Slater and Wilcox). Head and thorax (male). Lateral view. (b) *Toonglasia humerus* (Slater and Wilcox). Head and pronotum (female). Dorsal view. (c) *Toonglasia humerus* (Slater and Wilcox). Dorsal view (male).

were scattered over a considerable area of the Pacific slope in clumps up to 2 m high with individual stems 5 cm in diameter. The clumps usually occur about 30 cm apart. The insects occurred between the stems and the sheaths along the sides, never in the terminal leaves, and a maximum of three individuals was taken from a single sheath. It is remarkable that females and nymphs occurred only in sheaths near the base of the plant (45 cm), whereas most males occurred much higher, in sheaths, at 152 to 183 cm. Only two males were taken in the lower sheaths (observations between 2 and 3 p.m.). The "73-km" site was warmer (subtropical) and consisted of a small stand of bamboo growing beside the road at 1,100 m. As at the other sites, males were in sheaths much higher on the plants than were the females. The specimens from Acachuztocha listed above appear to be morphologically the same as the other material but are much darker in color. The legs are black rather than yellow, the membrane lacks the conspicuous pale yellow margin and the antennae are completely black. Both nymphs and adults of this black morph were taken on *Bambusa aculeata* (Rupr.).

Despite the striking color differences these specimens appear to be conspecific with the more typically colored specimens.

Fifth Instar

Head, pronotum, scutellum, mesothoracic wing pads, legs, thoracic pleura and sclerotized plates on abdominal terga 7-9 in large part dark chocolate brown shading to dull yellowish as follows: central area of vertex, diffuse transverse stripe across pronotum slightly anterior to dark basal stripe, mesal area of scutellum and a broad diffuse area across wing pads from slightly anterior to scutellar apex to level of middle of first abdominal tergum. Antennal segments 1-3 bright yellow, segment 4 black. Abdomen testaceous with SGA and SGP orange-tan, SGA 4-5 and 5-6 elliptical, much more strongly developed than SGP 4-5 and 5-6. No TM sclerites present anterior to tergum seven. TML row of spots large, round present on terga 3-6, TMC row of spots present on terga 3-7 as narrow dashes. T 7 absent. TL 7 and TM 7 completely separated, later almost attaining anterior margin of tergum seven and broadly sinuately truncate along anterior margin. TMA 7 present only as series of tiny dots.

SM 7 with lateral margins sinuate and anterior margin very broad and convex. SL 7 and 8 fused, well separated from SM sclerites. SM 6 bluntly triangular, apex rounded. No SM sclerites anterior to sternum six. Large round SML spots present on sterna 3-6. A pair of large, yellowish, sclerotized spots present within SML row at anterior margins of sterna 5 and 6, smaller pair on sternum 4. Comma-shaped SPC sclerotization present only on sterna 5 and 6.

Head nonconvex. Eyes small, sessile, set well away from antero-lateral angles of pronotum. Epicanthal stem very short. Length of head 0.85, width 0.93, interocular space 0.73. Anterior pronotal margin deeply concave, posterior margin shallowly concave, lateral margins narrowing in an even arc from humeral angles to anterior margin. Length of pronotum 0.88, width 1.68. Mesothoracic wing pads covering anterior two-thirds of abdominal tergum two, lateral margins slightly broadened from base to apex but not arcuate. Length of wing pads 1.59. Length of abdomen 4.51. All femora strongly incrasate. Fore femora with single very large spine on distal one-third of ventral surface arising from carinate elevated ridge. Labium extending midway between mesocoxae. Length of labial segment I 0.51, II 0.59, III 0.63, IV 0.44. Antennae terete. Length antennal segment I 0.27, II 0.76, III 0.68, IV 0.90. Total body length 6.44.

Runs to *Extarademus mundus* at couplet 36 in Slater (1979), but readily distinguishable by not having tergum 6 pink, having a longer labium with all of segment four and distal portion of segment three extending onto mesosternum and, of course, by its much larger size.

Toonglasa barrerae New Species

(Fig. 2, 3, 4, 6, 7, and 16)

General coloration black with pruinosae gray. Marked with dull yellow or tan as follows: apex of tylus, caudal half of posterior pronotal lobe, broad marginal stripe, diffuse dorsal stripe, extreme dorso-caudal (lateral) angle of metapleuron, distal ends of femora and tibiae, and tarsal segments one and two. Head completely shining above except for pruinosae area around each ocellus, below pruinosae, except shining about antenniferous tubercles and compound eyes. Pronotum above with anterior collar, broad transverse area across transverse impression and narrow posterior stripe pruinosae. Remainder of dorsal pronotal surface shining, large quadrate areas of calli glabrous, impunctate; shining interthoracic stripe broad, complete as single band, anteriorly "invading" transverse impression. Propleuron and sternum chiefly pruinosae, dorsal pruinosity of transverse impression broadly contiguous with that of pleuron; anterior shining area of anterior lobe continued ventrally midway to dorsal edge of acetabulum. Mesopleuron with pruinosity somewhat obsolete. Meso-acetabula pruinosae. Metasternum and acetabulum pruinosae, narrow posterior lobe of metapleuron shining. Scutellum and hemelytra predominantly pruinosae, former with median longitudinal shining ridge, latter with elevated radial vein not pruinosae on anterior two-thirds. Dorsal surface with scattered upstanding and decumbent sericeous hairs present.

Head very slightly declivent, tylus not attaining distal end of first antennal segment. Vertex convex, eyes set well away from antero-lateral pronotal angles and on short head extensions. Length of head 0.73, width 0.83, interocular space 0.51. Pronotum with lateral margins nearly straight from humeral angles to level of middle of calli, anteriorly strongly narrowing to anterior margin; shallow mesal depression between calli; transverse impression broad and shallow; posterior margin shallowly concave. Length of pronotum 1.17, width 1.27. Length of scutellum 0.51, width 0.57. Lateral corial margins almost straight. Length of claval commissure 0.46. Midline distance, apex of clavus to apex of corium, 1.15; midline distance, apex of corium to apex of abdomen, 2.44. Membrane broadly rounded apically,

reaching posteriorly to anterior margin of abdominal tergum seven. Metathoracic scent gland auricle elongate, slender, curving slightly cephalad. Evaporative area extending nearly to dorso-lateral margin of metapleuron and over posterior lobe of mesopleuron. All femora incrasate. Fore femora armed below on distal third with stout heavy spine. Labium extending well between fore coxae. Length of labial segment I 0.39, II 0.24, III 0.27, IV 0.27. Antennae conventionally terete with fourth segment fusiform. Length of antennal segment I 0.17, II 0.51, III 0.46, IV 0.66. Total body length 6.08. Posterior fourth of eighth abdominal sternum with series of raised obtuse longitudinal ridges (Fig. 4).

Parame (Fig. 6) slender, shaft and blade not distinctly differentiated, blade area strongly curved; outer projection small, trapeziform, inner projection short and acute, extending only slightly beyond margin of inner surface of blade, series of fine crenulations along shaft and blade. Sperm reservoir (Fig. 2 and 3) with very small bulb, barely visible above inner margin of wings; wings slender, straplike, strongly arched, coalescing on meson, not curved backward, widest distally. Pygopores (Fig. 7) elliptical, margins of dorsal opening irregular with truncate inward projection immediately before area of parame emergence.

Holotype male. Mexico: Guerrero: 5 km from Chilpancingo (Chilpancingo-Omitlame road), 1,470 m, 26-XI-81. (H. Brailovsky and E. Barrera) [on *Arthropodium longifolium* (Fourn.) E. G. Carrus]. In Instituto de Biología-UNAM Mexico D.F.

Paratypes: 2 males, 2 females. Same data as holotype. One male same data as above except 29-I-82. Three males, 2 females Jalisco: Jocotepec 26-X-82 (M. Garcia). In Instituto de Biología-UNAM Mexico D. F. and J. A. Slater collections.

There is no variation in pruinosity pattern in the type series. Females have the middle and hind femora bright reddish brown. The wing length is constant. The female ovipositor extends anteriorly to the posterior margin of abdominal sternum five but does not invade it.

We have also examined two males and two females taken with *T. yushanicola* on the bamboo *Yushania azureum* (see discussion under latter for habitat) on Road 40, 172 km Guadaluja-Barra de Navidad 20-VII-82 (H. Brailovsky). On this plant *barrerae* occurs on the leaves sometimes in company with *yushanicola*. These specimens appear to be conspecific with the type series of *barrerae* but are smaller, have a broader pale marginal band on the membrane of the fore wing and a more strongly pruinosae mesopleuron, and the females have dark reddish coloration on the first and second antennal segments.

This species is named for Ernesto Barrera, Instituto de Biología UNAM Mexico, who has collected many important Mexican Heteroptera, including much extremely valuable blissine material.

The type series was taken in the same habitat as *Toonglasa forficuloides* but on a different bamboo, *Arthropodium longifolium*, *T. haackstonae* (described below) also was taken on this bamboo. *Arthropodium* grows to about the same height as *Bambusa chusque* but its

more slender and flexible. The adults, at least, are found in the leaves, not in the sheath. A single specimen of an undescribed species was taken in the same habitat but in general swamping, so unfortunately the host is not known. We therefore have the interesting situation where two and possibly three species occur on bamboos at the same locality.

A single female taken 8 km from Chilpancingo, on the Chilpancingo-Omitlame road, 29-I-82 (H. Brailovsky) certainly represents an undescribed species, but we choose not to describe it formally until more material (especially males) becomes available. This species resembles *barrerae* in having large, partially glabrous, shining pronotal calli and a dark (but pale-margined) hemelytral membrane. The eyes are relatively much larger than *barrerae*'s, with the inner margins parallel to the longitudinal axis of the body for a considerable distance (angled in *barrerae*), and the labium is much shorter than in *barrerae*.

Toonglasa haackstonae New Species

Head, anterior pronotal lobe, scutellum, and most of femora black or gray pruinosae. Posterior pronotal lobe, corium, distal ends of femora and tibiae, tarsi, distal ends of acetabula, and dorso-caudal portion of metapleuron reddish brown. Hemelytral membrane dusky brown mesally, broadly pale yellow laterally. Pruinosity pattern generally similar to *barrerae*, differing as follows: head dorsally with pruinosity within compound eyes as well as above ocelli; pronotum with calli shining but anterior lobe pruinosae laterally on dorsum, shining humeral bar complete but narrow, not invading transverse impression. Propleuron and sternum completely pruinosae. Mesosternum shining but mesopleuron pruinosae from level of inner margins of acetabula to dorso-lateral margins. Scutellum with only distal fourth shining. Dorsal surface of head and pronotum densely clothed with decumbent silvery pubescence including entire surface of calli. Scattered short, upright hairs present.

Head with tylus nearly attaining distal end of first antennal segment. Vertex flat. Eyes set well away from antero-lateral pronotal angles, sessile. Length of head 0.56, width 0.66, interocular space 0.39. Shape of pronotum similar to *umbratus*, transverse impression relatively wide. Length of pronotum 1.00, width 1.00. Length of scutellum 0.44, width 0.44. Lateral corial margins gently convex. Length of claval commissure 0.44. Midline distance, apex of clavus to apex of corium, 1.07. Midline distance, apex of corium to apex of abdomen, 1.71.

Membrane broadly rounded apically, extending posteriorly over proximal half of abdominal tergum seven. Metathoracic scent gland auricle, evaporative area, femoral size and spination, and antennal shape all similar to *barrerae*. Length of labial segment I 0.24, II 0.15, III 0.18, IV 0.27. Length of antennal segment I 0.15, II 0.44, III 0.34, IV 0.51. Total body length 5.03.

Posterior portion of eighth abdominal sternum with series of longitudinal obtuse ridges as in *barrerae*.

Holotype: male. Mexico: Guerrero: 11 km from Chilpancingo (Chilpancingo-Chichihualco Road) 28-XI-81

(Harry Brailovsky). In Instituto de Biología UNAM Mexico D.F.

Paratypes: 2 males, 3 females. Mexico: Guerrero: 73 km from Cuernavaca (Aguila-Cuernavaca Road) 30-I-82 (H. Brailovsky, E. Barrera, M. García, A. Ibarra). One male, 5 km from Chilpancingo (Chilpancingo-Omitleme Road) 26-XI-81 (H. Brailovsky and E. Barrera). Three males, 1 female Puebla: 19 km Carr. Izucar de Matamoros-Huajuapen de Leon 19-X-82 1,450 m. (H. Brailovsky and E. Barrera). In Instituto de Biología, UNAM Mexico D.F., and J. A. Slater collections.

That *T. barrera* and *T. thackstonei* are closely related is shown by the peculiar ridge eighth abdominal sternum, similarly shaped metathoracic scut gland auricle, almost identical incrassate and armed fore femora, short labium, and general shape of the pronotum. Nevertheless, *thackstonei* may be readily distinguished from *barrera*. It is much less robust and hence a relatively more elongate species, which is perhaps best expressed by the pronotum being wider than long in *barrera* but the two subequal in *thackstonei*. The eyes are sessile in *thackstonei* but placed on a protruding shelf in *barrera*. In *barrera* the vertex is convex rather than flat, and the labium is relatively short as compared with the body length. In *thackstonei* the labium is considerably shorter than the pronotal length, whereas in *barrera* the two are subequal.

The differences in pruinosity are striking for what appear to be such closely related species. The two also differ in that there is only a narrow, discrete intermarginal shining bar in *thackstonei*, and this species lacks any propleural shining areas and has a reduced scutellar shining area. The light rather than dark gray clavus and corium and the light to very fine membrane in *thackstonei* may also prove to be diagnostic, but these features tend to be more variable than the differences discussed above. Indeed, *thackstonei* in general appears more similar to *umbrosus* than to *barrera*, but the lack of sternal spines in *thackstonei* will readily separate the two.

This species is named for Elizabeth Thackston Slater, the wife of James A. Slater.

Toonglasa yushaniacola New Species (Fig. 11)

Body relatively broad and robust, nearly parallel sided. Head and anterior pronotal lobe black; pruinosae areas gray. Posterior pronotal lobe, scutellum, hemelytra, and abdomen uniformly bright reddish brown. Antennae, labium, and ventral and pleural surfaces of body black or gray, but abdominal sternum laterally contrastingly brown. Legs uniformly yellowish tan. First antennal segment tinged with dark red. Body chiefly pruinose with tylus, comma-shaped mark before ocelli, large quadrate calli patches, and a complete band across pronotum between humeri contrastingly shining; calli surface a mixture of pruinose spots and shining interspaces. Scutellum and mesopleuron completely pruinose. Clothed sparsely with semi-erect and decumbent hairs.

Head nonclivent, tylus not broadly widened distally, extending to or slightly beyond middle of first antennal segment. Eyes slightly protuberant, set well

away from antero-lateral pronotal angles. Length of head 0.74, width 0.88, interocular space 0.44. Pronotum broad, lateral margins nearly parallel sided from humeri to middle of anterior lobe; transverse impression shallow but complete; posterior margin evenly concave. Length of pronotum 1.14, width 1.38. Length of scutellum 0.66, width 0.76. Hemelytra with lateral margins slightly convex, leaving connexiva partially exposed from terga 3 through 7. Length of claval commissure 0.56. Midline distance, apex of clava to apex of corium, 1.50. Midline distance, apex of corium to apex of abdomen, 1.98. Membrane extending posteriorly to anterior third of tergum 7. Abdominal sternum with numerous short stout spines on segments 3 through 7. Eighth abdominal sternum with acute elevated keel arising in middle of sternum, becoming progressively more elevated posteriorly, becoming rounded and downward curved posteriorly (Fig. 11). All femora strongly incrassate, each fore femur with single large, dark spine ventrally on distal third. Labium extending posteriorly between fore coxae but not attaining mesosternum. Length of labial segment I 0.40, II 0.28, III 0.30, IV 0.36. Antennae slender, terete. Length of antennal segment 1 0.22, II 0.72, III 0.58, IV 0.74. Total body length 6.32.

Holotype: male. Mexico: Jalisco: Autlan, Road 40 172 km Guadalupe-Barrá de Navidad 20-VII-82 (Harry Brailovsky). In Instituto de Biología, UNAM Mexico D.F.

Paratypes: 3 males, 4 females. Mexico: same data as holotype. In Instituto de Biología, UNAM Mexico D.F., and J. A. Slater collections.

There is little variation in the type series. In some paratypes the scutellum is gray rather than brown pruinose and the gray pruinosity of the anterior pronotal lobe (sometimes) extends posteriorly onto the posterior pronotal lobe.

This large, robust species is similar to *tomorsis* in pruinosity pattern but is much larger and, as noted in the key above, has completely different male secondary sexual modifications on the pregenital abdomen.

The type series was collected on the bamboo *Yushania azureorum* McClure-W. Smith. This bamboo formed a large clump. It occurred on the Pacific slope at about 1,520 m of elevation in an area of subtropical climate. The soil in the area was brown with much humus, and numerous *Quercus* sp. were present. This is a more humid area than that at Omitleme (Guerrero) where the other species of *Toonglasa* described here were taken. Individuals of *yushaniacola* occur both between the stem and the sheath as well as on the leaves.

Toonglasa tomorsis (Slater and Wilcox)

New Combination

This species was originally described by Slater and Wilcox (1966) from Panama and Guatemala. It has not previously been reported from Mexico. On 28 January 1982, Brailovsky and his party took 22 males, 8 females, and a number of 5th instars 42 km from Chilpancingo on the Chilpancingo-Acapulco Road (Guerrero) in general sweeping but could not determine the host plant. The habitat was at 960 m in a dry area with low

rainfall throughout the year. The insects were in a small patch of grasses growing near the main road.

Specimens were also collected at: 213 km from Puente Azufre on the Pochutla-Oaxaca Road, 7-II-82 (A. Ibarra) (2 males, 1 female), and El Ocotito, Guerrero 28-82 (A. Ibarra, E. Barrera, H. Brailovsky, M. García) (3 males, 2 females, 1 nymph); 5 km from Chilpancingo, 1,470 m, and (Chilpancingo-Omitleme Road) Guerrero 29-I-82 (A. Ibarra) (1 female).

There is little structural variation but a considerable difference in the color in this Mexican material. In four males and one female, the pronotum and scutellum are dark gray-black, essentially concolorous with the dorsal surface of the head. All femora are black except distally. Six males and one female have the anterior pronotal lobe dark, but the posterior lobe contrasting reddish brown and with at least a partially brown scutellum. The legs are dark but usually somewhat more reddish brown than in the preceding group. Finally, there are six females with a completely reddish brown pronotum and scutellum and light brown legs. Specimens exhibiting these differences are not general and occur at more than one locality. Since none of the males is completely reddish brown but most of the females are, there appears to be sexual dichromism, but dark and intermediate females do occur, and most males are "intermediate."

Fifth Instar

Nearly uniformly pale yellow. TML, TPC, SML, and SPC rows of abdominal spots contrastingly black. Margins of SG, TL7, SM6, and SL7, spiracle margins, anterior and lateral margins of TM7 and SMT segments narrowly darker. Fourth antennal segments, distal ends of terga, and labium dark chocolate brown to black.

SGA sclerites large and ovoid. TM7 broadly truncate anteriorly. TL7 completely separated from TM7. TML, TPC, SML, and SPC rows as in *forficuloides*. Labium extending between fore coxae, third segment exceeding base of head by nearly one-half its length. Length of head 0.37, width 0.56, interocular space 0.37. Length of pronotum 0.56, width 0.93. Length of mesothoracic wing pads 1.07. Length of abdomen 1.46. Length of labial segment I 0.24, II 0.17, III 0.17, IV 0.24. Length of antennal segment I 0.13, II 0.32, III 0.32, IV 0.46. Total body length 4.38.

The nymph of *tomorsis* will key to couplet 36 in Slater's (1979) key to blissine nymphs. This couplet contains *mundus* and *umbrosus*. From both of these species *tomorsis* may be readily separated by its shorter labium which extends posteriorly onto the fore coxae.

Toonglasa collaroides (Slater and Wilcox)

New Combination

This species was previously known only from Brazil and Argentina.

Suriain: 1 male Paramambo 17-XI-59 (P. H. van Dossburg, Jr.). Argentina: 1 male, 2 females. El Alto Misiones 30-XI-64 and 15-X-64 (A. Kovacs). In Leiden Museum and American Museum of Natural History.

Fifth Instar (Pinned)

Argentina, same locality as above, 11-I-64 (A. Kovacs).

Head, pronotum, scutellum, base and apical third of wing pads and anterior segments three and four dark red-brown to black. Remainder of wing pads, antennal segments 1 and 2, pronotal lateral flanges, and legs sordid yellow to yellowish brown. Abdominal tergum 1 yellow mesally except for narrow brown strip adjacent to posterior margin. Tergum 2 light brown. Tergum 3 light brown with yellow areas antero-lateral. Terga 4-6 chiefly yellow with red areas on posterior one-half. Sternum with similar coloration. SGA sclerites greatly enlarged, ovoid, nearly three times as large as SGT; TML row with prominent spots; TPC spots small, irregular; TM6 present as two narrow well separated transverse dashes on either side of midline near posterior margin of tergum; TL8 absent or reduced to a few tiny dots; TM7, TA7, TM7A, and TM7L fused into large quadrate sclerite covering nearly entire tergum, slightly concave at antero-lateral angles; TL7 narrowly, longitudinally elongate, distinctly separated from TM7. SM6 trianguloid, nearly attaining anterior and posterior margins of sternum; SM7 large, lateral margins sinuate, anterior margin in contact with sternum six; SML and SPC rows with large prominent spots.

Length of head 0.42, width 0.62, interocular space 0.42. Length of pronotum 0.76, width 1.04. Mesothoracic wing pads extending nearly to posterior margin of abdominal tergum two, length wing pads 1.34. Length of abdomen 3.52. Fore femora moderately incrassate, armed below with single sharp, stout spine. Labium short, barely attaining anterior margin of fore coxae, second segment remote from base of head. Length of labial segment I 0.24, II 0.18, III 0.20, IV 0.27. Antennae short, terete. Length of antennal segment I 0.16, II 0.30, III 0.30, IV 0.37. Total body length 5.56.

There is very little variation in the series available for study. In some specimens TM6 is represented by a single transverse dash not divided at the midline.

Toonglasa humerus (Slater and Wilcox)

New Combination (Fig. 17a, b, c)

This species is known only from Panama. It was originally described only from females. Slater (1979) illustrated the male. The species is remarkably sexually dimorphic. Males (Fig. 17b, c) have not only much bulkier pronota but also curving more strongly incrassate fore femora and a large curving median spine on the prosternum.

Ashlock and Engleman took a series breeding on *Pennisetum purpureum* Schumck. at El Valle, Panama. This is an enormous, reedlike grass. The insects were taken lying closely adpressed between the stem and the leaf sheath.

Fifth Instar

Panama: Cocle Province. El Valle 700 m. 17-V-73 (P. D. Ashlock).

Very similar in color and structure to *colloroides*. Femora and tibiae dark chocolate brown although paler distally on femora and proximally on tibiae. TM6 absent. Fore femora strongly incrassate. Length of head 0.52, width 0.72, interocular space 0.44. Length of pronotum 0.86, width 1.16. Length of mesothoracic wing pads 1.46. Length of abdomen 2.88. Labium extremely short, third segment barely attaining base of head. Length of labial segment I 0.18, II 0.14, III 0.16, IV 0.26. Length of antennal segment I 0.20, II 0.38, III 0.34, IV 0.62. Total body length 5.04.

***Toonglasa umbratus* (Distant) New Combination
(Fig. 8 and 9) Fifth Instar**

Arizona: Oracle.

Head, pronotum, scutellum, wing pads, legs, and antennal segment 4 bright red-brown to yellowish brown. Mesothoracic wing pads becoming testaceous laterally on mesal third. Antennal segments 1 and 2, and proximal one-third of 3 yellow, becoming light brown on remainder of third segment. Abdomen tan with tergum 1 and mesal third of anterior lobe of segments 4 and 5 creamy white. SGA sclerites ovoid to subrectangular, greatly enlarged, much wider longitudinally than SGP; TML row consisting of round spots; TPC row a series of tiny dashes; TM6 absent; tergum 7 with single large, rectangular sclerite covering most of tergite, concave antero-laterally, its anterior margin nearly touching with posterior margin of sternum six; ITL narrow, longitudinally elongate, well separated from TM7 (Fig. 8). SM6 triangular, not attaining anterior or posterior margin of sternum; SM7 with lateral margins deeply concave, truncate anteriorly, touching posterior margin of sternum 6 (Fig. 9).

Length of head 0.41, width 0.52, interocular space 0.36. Length of pronotum 0.52, width 0.78. Mesothoracic wing pads extending over anterior third of second abdominal tergum, length of wing pads 0.88. Length of abdomen 3.82. Fore femora moderately incrassate, armed below on distal third with a single sharp spine. Labium short, barely attaining anterior margin of fore coxae. Length of labial segment I 0.22, II 0.14, III 0.12, IV 0.14. Antennae terete, fourth segment narrowly fusiform. Length of antennal segment I 0.11, II 0.26, III 0.25, IV 0.44. Total body length 4.52.

Nymphs from other localities differ from this Oracle, Ariz., specimen in being nearly uniformly yellowish to brownish yellow overall, or with the abdomen variegated reddish and white; sometimes with the sclerites, head, pronotum, scutellum, and wing pads little darkened and not strongly contrasting with the ground color of the abdomen. In the Arizona specimen these areas are dark brown, strongly in contrast with the light abdomen. However, there do not appear to be morphological differences in the nymphs or in the adults from the same localities.

Some of the nymphs from Fort Huachuca, Ariz., and Galetta Island, C.Z., have diffuse reddish areas on the posterior half of abdominal segments 3, 4, and 5, and have the head and fourth antennal segment contrasting dark brown.

T. umbratus is variable in color and differences in the nature and degree of wing reduction and in the size and shape of the shining areas on the pronotal calli, appear to have geographic significance.

Slater and Wilcox (1966) treat *Ischnodemus cahabonensis* Distant and *I. umbratus* (Distant) as probable synonyms of *Ischnodemus macer* Van Duzee, and Slater (1979) lists them as synonyms. However, both are earlier names, and *umbratus* is here selected as the correct name.

The distribution is much more extensive than the literature would suggest (see below). Slater and Wilcox (1966) list it from Arizona, Texas, and Iowa. *I. cahabonensis* and *umbratus* were both described from Guatemala.

T. umbratus is known to breed upon several species of grasses. Slater (1976) reports nymphs and adults breeding in Panama upon *Andropogon glomeratus* (Walt.). B. sp. and on *Bothriochloa thymoides* (R. Br.) A. Camus. Brailovsky swept it in numbers from *Hyperharia rufa* (Nees) Staph. in Mexico.

(Additional locality data: United States, Texas: Green Gulch, Big Bend Natl. Park (Brewster County). 12 mi S Marfa. The Basin, Chisos Mts., Big Bend Natl. Park (Brewster County). 13 mi S Marathon. Navasota River, Hwy 30 (Brazos County). 35 mi SW Marfa. H. O. Canyon, Davis Mts., 6,200 ft. (Jeff Davis County). 18 mi S Marfa. 4,800 ft 24 mi WSW Ft. Davis (Jeff Davis County). 1 mi N Rockpile Roadside Pk., W. Ft. Davis (Jeff Davis County). 15 mi NW Ft. Davis (Jeff Davis County). Madera Canyon, W Ft. Davis (Jeff Davis County). Point of Rocks, W Ft. Davis (Jeff Davis County). 12 mi SE Ft. Davis (Jeff Davis County). 15 mi N Ft. Davis (Jeff Davis County). 8 mi S Ft. Davis (Jeff Davis County). Laredo 39413 (intercepted with tomatoes from Mexico). Davis Mts. Arizona: 5 mi SE Fort Huachuca (Cochise County). 5 mi NNE Sonoita (Santa Cruz County). Santa Rita Mts. San Xavier. Montezuma Pass Coronado Natl. Memorial. Chiricahua Mt. Madera Cyn. Santa Rita Mts. 2.5 mi W Peña Blanca (Santa Cruz County). Faraway Ranch, Oracle. Catalina Mts. 10 mi Bear Cn. Mustang Mt. Rustlers' Park, Chiricahua Mts. (Cochise County). Santa Rita Mts. Parker Ranch. 6 mi W Montezuma Ps. Hauchuca Mts. (Cochise County). Catalina Mts. Hehck. Hwy. 124. Mt. Lemmon. Sunnyside, W Side Huachuca Mts. 5,800 ft (Cochise County). Canelo. Stockton Pass Graham 5,800. Atascosa Lookout 5,500 ft (Santa Cruz County). Molino Basin Picnic Area Mt. Lemon Rd., Santa Catalina Mts. (Pima County). Kansas: Riley County. Nebraska: Winnebago. Iowa: Sioux City. 3 mi SE Holly Springs (Woodbury County). Stone State Park, Sioux City, New Mexico: Silver City. Oregon: Josephine County. Panama: Kobe Beach, C. Z. Galeta Is., C. Z. 21 mi SW Chepo. Coco Solo, C. Z. Contractors Hill, C. Z. El Salvador: 6 mi N La Libertad 1,300 ft. Costa Rica: 6 mi SW Canas Taboga 10°19'N 85°09' W (Guanacaste Prov.). Guan. 31 mi NW Liberia San Jose 10 mi SE San Isidro del General 1,800 ft. Honduras: Com. 5 mi and 13 mi NW Comayagua 1,600 ft. Zamorano (Dept. Morazan) 2,600 ft. 3 mi NE Omao. 7 mi SE Puerto

Cortez. 21 km NW Siguatepeque Ch S Rd. Santa Rosa 4,000 ft. Com. Hwy. 1, 13 NW Comayagua. Colombia: Dept. Cundinamarca, El Boqueron 600 m 75 km SW Bogota. Brazil: Roraima 25 km NNW Boa Vista 140 m. Belize: Belize, mile 30 Western Highway. Mexico: Nayarit Tepic, 24 mi SE. Tepic. Colima: La Salada, Jalisco, Isla Isabel, El Tuito (near Chabela). Veracruz, Palma Sola. Ocotlán Chico. Puente Nacional. Estado de Mexico, Tenancingo. Chalma. Oaxaca, 49 mi. N. M. Romero, Bethania. Tabasco, km 23 Road Coatzacoalcos-Villahermosa. Quintana Roo, Road Chetumal-Carillo Puerto near Reforma. Gliontura. Chabela Bay. Cuernavaca, Morelos. Jalapa 10 mi E Cananea SON. 6 mi NW ca. 6,000 ft. Guadaluajara. Dgo. 21 m NE Durango 6,200 ft. In American Museum of Natural History, Bishop Museum, Instituto de Biología, UNAM Mexico D.F., M. H. Sweet and J. A. Slater collections.

***Toonglasa tylosis* Slater and Wilcox New Combination**

Thus far known only from Mexico.

Mexico: Puebla: Paso de Chichualco.

***Toonglasa mundus* Slater and Wilcox New Combination**

The junior author took a single male on *Bambusa*

occidentalis (Rupp.) Hicche at the following locality: Oaxaca; km 40 Carr. Puerto Angel-Pinotepa Nacional 12-XI-82.

Thus far known only from Mexico.

Mexico: San Luis Potosí: 7 mi N San Vicente (S of Tamuin). Vera Cruz: Las Tuxtlas.

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