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SOME NEW SPECIES OF THE GENUS *MISTHARNOPHANTIA*, KIRKALDY (Subfamily Flatinae, Family Fulgoridae, Homoptera)

KATHLEEN C. DOERING and CHESTER J. SHEPHERD
Lawrence, Kansas

Abstract:

This paper comprises a taxonomic study of the genus *Mistharnophantia*, described by Kirkaldy in 1907. A brief history of the genus and comparative notes are given. A key to the species is included. The following six new species are described: *curta*, *ajoensia*, *extensa*, *simia*, *angusta* and *acuta*. *Rhyncopteryx caudata* Van Duzee is considered a synonym of *Mistharnophantia sonorana* Kirkaldy.

History of the Genus

Kirkaldy described the genus in 1907 with *sonorana* as the only existing species. In 1914 Van Duzee described a new genus and species which he called *Rhyncopteryx caudata*. He compared this genus to *Cyarda* but apparently was unaware of the existence of the Kirkaldy species. Comparison of two paratypes of *Rhyncopteryx*, which Mr. Ross of the California Academy of Science sent for study by the authors shows *Rhyncopteryx caudata* to be *Mistharnophantia sonorana* Kirkaldy, although the paratype of the former seems to have a slightly more bulbous head than the Nogales material of *sonorana*.

Comparative Notes on the Genus

The genus includes species of medium size, averaging approximately 6 mm. for the females, with the males somewhat smaller. Tegmina to apex of clavus slightly longer than broad, produced into an abrupt tail or cauda at apex of clavus and inflated into a conspicuous hump at about basal fourth of corium. The female is broadly angular, with cauda pointed upward. The cauda is lanceolate, extending beyond the tip of the clavus about three times its width at that point. Vertex transverse, about two or three times wider than its median length, subtruncate apically, carinate in the middle, lateral margins diverging anteriorly. Frons sloping backward and upward so that a part of the base shows from above, the disk of this basal portion sharply depressed, its apical margin sharply concave and its lateral margins expanded and slightly rolled forward. Pronotum transverse from above, its lateral portion extending collar-like around and below the eye, a sharp carina elevated somewhat ear-like posterior and mesad of eye and a conspicuous tubercle laterad of the carina. Mesonotum tricarinate.

Key to the Species

1. Cauda of corium not more than about one-sixth of total dorsal length of body, only slightly elevated.....2
 Cauda of corium one-fifth to one-fourth total length of body, elevated3
2. (1) Frons length and width equal; cauda bluntly shortened, clavus three and one-half times longer than cauda.....*curta* n. sp.
 Frons width greater than length, clavus not quite three times longer than cauda, cauda roundly pointed, from lateral view tip of frons slightly depressed.....*ajoensia* n. sp.
3. (1) Median length of frons equal to or less than median length of vertex; from below basal margin of frons truncate or nearly so4
 Frons slightly longer than median length of vertex, bulbous and rounding6
4. (3) Head shorter, extending beyond eye a distance less than or equal to length of eye; from below basal margin of frons truncate*sonorana* (Kirkaldy)
 Head longer, extending beyond eye a distance usually one-third greater than length of eye; frons from below with basal margin rounding5
5. (4) Lateral margins of vertex longer than median length of frons, anterior margin of vertex straighter than in most species; from lateral view median width of gena in front of eye is equal to more than one-half median width of frons, insect only slightly snub-nosed; from lateral view posterior half of tegmen abruptly narrowed and posteriorly elongated, with cauda more spatulate*extensa* n. sp.
 Lateral margin of vertex subequal to median length of frons, tip of head bulbous so that from side view the females especially appear snub-nosed; from a lateral view median width of gena in front of eye is equal to one-half median width of frons; tegmen not so abruptly narrowed.....*sima* n. sp.
6. (3) Median length of frons from above twice length of vertex, vertex width distinctly narrower than frontal area, a deep concavity across disk of frons and vertex; posterior half of male tegmen greatly elongated but broader with spatulate cauda, dark fuscous coloring*angusta* n. sp.
 Median length of frons long but not twice length of vertex, vertex not much narrower than frons, no pronounced concavities on disks; lower margin of tegmen acutely angled, then abruptly narrowing to a sharply pointed cauda; head pointed.....*acuta* n. sp.

Mistharnophantia sonorana Kirk. 1907

(Plates I, II, III)

Original Description

Brownish testaceous; a broad, dark fuscous stripe running from apex of head (dorsally) to hind margin of scutellum. Tegmina opaque coriaceous, pale brownish yellow, veins partly concolorous, partly dark fuscous. Length about $3\frac{7}{8}$ mm.

Hab. Arizona, Nogales; (Koebiles No. 2498). Only one specimen in bad condition, unfortunately, of this curious form; it is parasitized. It is very Issinae in appearance, but the granulation of the clavus and the structure of the head proclaim it to be Poekillopterine. It is probably allied to *Hyphancylus*, Fowler, which that author places apparently incorrectly in the Issinae.

Comparative Notes

Size. Length of male from apex of head to tip of posterior claval suture 3.5 mm.; from tip of claval suture to tip of tegmen 1 mm.; length of tegmen 4.25 mm.; width of tegmen 2.5 mm. Female, 4 mm. from apex of head to posterior tip of claval suture; from tip of claval suture to tip of tegmen 1 mm.; length of tegmen 4.25 mm.; width 2.7 mm.

Color. Color dull yellowish or testaceous brown with veins of corium lightly mottled with dark in male, distinctly darker in female; a dorsal brown stripe extending from apex of head to tip of mesonotum and cauda deep fuscous, shaping gradually on to corium proper, cauda with a pale mark at base.

M. sonorana has a distinctly shorter head than any of the other species described in this paper. From a dorsal view the frons extends beyond the vertex a distance less than the median length of the frons and the vertex itself is shorter also in that the anterior margin of the vertex lies directly in line with the anterior margin of the eye. From a lateral view the ventral margin of the frons is so straight that it gives a distinctly flat-faced appearance with the dorsal and ventral margins of the head forming a pronounced angle. The cauda of *sonorana* is short, sharp-pointed and not elevated particularly as in other species.

Male Genitalia. The aedeagal structure is asymmetrical. The aedeagus proper is entirely hidden by the sleeve-like theca. On the right side the theca bears a sclerotized hook which at base is nearly three times wider than in middle and which extends four-fifths of the thecal length, on left side is found another sclerotized hook which is little less than half of the thecal length, both hooks with sharp apices. Each harpago as viewed from a lateral view is a convex semi-circle which is one-third longer than wide at a point just anterior to dorsal hook. The hook is about two-thirds the width and bends anteriorly toward the concave side.

Female Genitalia. Tenth segment is about one and one-fourth times longer than broad, somewhat heart-shaped, the anal flap tapering to a

rounding apex. Stylus of eleventh segment conspicuous. The dorsal valves markedly reduced with their apices rather delicate and pointed. The ventral valves well developed, about one and one-half times longer than broad with a smaller spine extending about two-thirds the greater length of valve. The sheath drawn to a blunt point in middle of the dorsal margin so that at this point its width is equal to its length. There are five larger posterior teeth and five lateral teeth.

Geographical Distribution. Type locality is Nogales, Arizona. The authors have studied the specimens of this species from the following localities; a large series of about 60 males and 60 females from Nogales. Other places in Arizona are as follows: Santa Rita Mountains, 21 males and 14 females; Sasabe, 6 males and 6 females; Alter Valley, 2 males; Patagonia, 4 males and 2 females; Yarnell Mountains, 1 female and 6 males; Baboquivara Mountains, 8 females and 2 males; Littlefield, 4 males; Superior, 1 male and 1 female; San Cata Mountains, 1 male; Atoscasa Mountains, 5 females and 5 males; Tuscon Mountains, 1 female; Yavapai, 1 male and 1 female; Arivaca, 7 females; Chiricahua, 3 females; Alamo, 1 female; Congress Junction, 16 males and 13 females; Sabino Canyon, 5 males and 37 females; Tucson, 12 females, 12 males; Quinion Mountains, 2 females and 1 male; Hope, 1 male; Ruby, 1 female; Vail, 1 female; Miami, 1 male. Specimens from California are as follows: Huntington Beach, 13 females, 7 males; San Diego, 2 males; Jacumba, 3 females and 4 males; Sunset Beach, 3 females and 4 males; Gaviota, 3 males; La Jolla, 60 males and 55 females; San Monica, 3 females and 1 male; Campo, 2 males; San Onofre, 1 male and 1 female; Carlsbad, 4 males; Ventura, 1 male. Other places include Chaves Co., New Mexico, 1 female; White City, New Mexico, 1 female; Homestead, Florida, 4 males and 2 females; Hillard, Florida, 1 male; Seymour, Texas, 3 females and 5 males; Carrizo, Texas, 1 male.

***Mistharnophantia acuta* n. sp.**

(Plates I, II, III)

Size. Length of male from apex of head to posterior tip of claval suture 3.5 mm.; from tip of claval suture to tip of tegmen 1.25 mm.; length of tegmen 3.75 mm.; width of tegmen 2 mm. Female from apex of head to posterior tip of claval suture 4 mm.; from tip of claval suture to tip of tegmen 1.25 mm.; width of tegmen 2.25 mm.

Color. General body and tegmen of male testaceous. Frons light brown darkened at base, clouded with fuscous across disk, inside lateral margin near base a dark dash sometimes indicated. Clypeus dark reddish brown. Gena in front of eye marked with three small darkish dots. Apex of clavus and cauda of tegmen dark fuscous, veins lightly mottled with fuscous. Female much darker, lateral markings on frons stronger, tegmen with fuscous areas enlarged, forming a semicircular depressed spot on clavus, an interrupted brownish streak following claval suture and 2 or 3 brown cells on apex; anterior part of corium moderately clouded with dark; posterior half

more uniformly dark, except for an isolated club-shaped testaceous spot and 2 or 3 smaller round spots just anterior to cauda.

Structural Characteristics. Vertex is twice as wide as its median length, the median length being a little less than median length of dorsal part of frons. Lateral dorsal margins of frons straight, giving head from above a much narrower, pointed appearance than in any other species. The apex of frons is rolled backwards slightly, thus from a lateral view the apex of head is produced upwards. Anteriorly pronotum is roundly produced to the middle of the eye; its median length is one-half the mesonotum. Mesonotum has two lateral carinae with a slightly depressed area between; the posterior tip is drawn to a point. Frons, from below, shows its greatest length equal to its greatest width; circularly rounded basally and anteriorly convex, posteriorly flattened, the sides rolled forward. The greatest length of clypeus is equal to median length of frons. From the point of greatest width the tegmen of the male narrows abruptly, while in the female the tegmen is more broadly narrowed. In both male and female the cauda is sharply constricted at tip of clavus and from there narrows to a point. The venation of tegmen is as follows: Sc. follows costal margin and joins Sc. near apex; R rather weak, apparently two branched; M rather weak, apparently two branched; Cu, follows claval suture, then extends to form the reticulation of the lanceolate cauda; anal veins, 1st A and 2nd A, converge near posterior tip of claval suture.

Male Genitalia. The aedeagal structure is asymmetrical. The aedeagus proper is entirely hidden by the sleeve-like theca, which in this species extends beyond the posterior end of the aedeagus. On the left side the theca bears a thickened sclerotized hook which at the base is twice as wide as in the middle and extends two-thirds of the thecal length. On the right side a shorter sclerotized hook is present which is thicker, arcuate and extends about half the thecal length. Each harpago as viewed from a flattened lateral view is a convex, semi-rectangular plate which is about twice longer than wide, and bears an apical, dorsal process or hook which is about two-thirds the length of the harpago. This hook is longer than in other species.

Comparative Notes. This species closely resembles *M. sonorana*, but both male and female are a little smaller than *sonorana*. The cauda is drawn more to a point and posterior portion of tegmen of male is more abruptly narrowed. The vertex in *M. sonorana* is three times as broad as long; in this species it is twice as broad as long. The apical margin of the frons from above and below is rounded while in *sonorana* it is truncate. The harpago has a longer hook, the sclerotized hook of the theca is more equal in size and both are thickened and the hooks are on different respective sides than in *M. sonorana*. This species resembles *sima* n. sp. From this species it is separated by the longer cauda, more flattened disk of frons and the extremely dark tegmina of females with the characteristic islands of light spots. It also resembles *M. angusta* by having a lengthened frons but the vertex is proportionally shorter in *angusta*. From all of the above species it is separated by the more pointed head.

Notes on Distribution and Location of Types. This species was described from numerous specimens taken from the following places: holotype male and allotype female, Elmendorf, Texas, July 3, 1936, M. B. Jackson. Paratypes: three males, and one female, same time and place, M. B. Jackson. Additional paratypes: twenty-six males and nineteen females, Silver City, New Mexico, July 22, 1936; seven females and three males, Elmendorf, New Mexico, July 21, 1936; four males and two females, White Sands, New Mexico, June 30, 1932; four males, Chaves Co., New Mexico, July 8, 1927; one female, Faluria, Texas, January 1, 1946; two females and three males, Las Cruces, New Mexico, August 8, 1936; two males, St. George, Utah, August 18, 1936; two males and one female, Catarina, Texas, July 6, 1938; one male, Belen, New Mexico, July 20, 1936; all collected by R. H. Beamer. In addition one male paratype, Kendell, New Mexico, July 27, 1928, L. D. Beamer, and one male paratype, Alamogordo, New Mexico, June 30, 1932, J. D. Beamer. All above types in the Snow Entomological Collections. Paratypes in the United States National Museum as follows: Eight males, Dixie, Utah, September 10, 1915, E. D. Ball; four males, Dixie, Utah, August 29, 1930, E. D. Ball; two females and one male, Tia Juana, Mexico, August 3, 1912, E. D. Ball; one male, Buckhorn, New Mexico, August 3, 1929 (no collector); three males, St. George, Utah, July 24, 1908 (no collector); one male and one female, Utah-Nevada, August 30, 1930 (no collector); one male, North Lordsburg, New Mexico, August 10, 1929 (no collector). Finally, two males and one female paratypes, Steins, New Mexico, August 8, 1932, R. H. Painter, and one female, White Sands, New Mexico, August 8, 1936, R. H. Painter, in the collection of the Kansas State College, Manhattan, Kansas.

Mistharnophantia ajoensia n. sp.

(Plates I, II, III)

Size. Length from apex of head to tip of posterior claval suture 3.25 mm.; from tip of claval suture to tip of tegmen 1 mm.; width of tegmen 2.25 mm.

Color. General color of body and tegmina, yellowish brown with scattered fuscous markings. An irregular reddish brown stripe extends from tip of head to apex of mesonotum. The lateral carinae are bordered with a brown fuscous stripe. The sides of the frons and anterior portion are greenish color, the rest mottled tan. The clypeus is a reddish color. On the gena in front of the eye are three small brown dots. Tegmen tan, cauda and longitudinal veins brown, boundary of the saddle-like depression in mid clavus outlined with dark brown. The female is a little darker with an island of fuscous coloring on the tegmen and heavy marking along longitudinal veins, cells of costal border brown.

Structural Characteristics. Vertex at its greatest length is equal to median length of the dorsal part of frons and is three times as wide as its median length. Frons as viewed from below, width greater than length with its apex circularly rounded and anterior margin emarginate; viewed from above with two little depressed areas anterior to the vertex and a median

carina extending from tip of head to posterior part of vertex. Pronotum with anterior margin broadly, roundly produced and its posterior margin shallowly concave; its length through the middle approximately one-half of the length of mesonotum. Mesonotum with two slightly elevated outwardly curved carinae, the disk between them depressed slightly, also a light elevated carina anteriorly. Tegmen, as in *curta*, abbreviated, clavus not quite three times longer than cauda, cauda roundly pointed. The venation of the tegmen is as follows: Sc₁ following expanded costal margin for about one half of tegmen; Sc₂ runs across the elevation then branches to meet Sc₁ in costal margin; R runs to middle of tegmen then joins the posterior reticulated area; M runs for a short distance, then branches and along with Cu₁ and its branches makes up the venation of the thickened cauda; Cu₂ forms claval suture; 1st A follows claval suture for one-third the distance of clavus then joins 2nd A and the two extend to claval tip; 2nd A is elevated to form the hump near the commissural margin.

Comparative Notes. This species resembles *curta*, both being small species with abbreviated caudae. The cauda of *corium* in this species is longer than in *curta* but is shorter than in *sonorana* and other species of the genus. For further comparison see notes under the description of *curta*. The male and the female are nearly the same color and the tegmen is nearer the same shape in the two sexes than we find in other species of the genus.

Notes on Distribution and Location of the Types. The species was described from five specimens taken in the Ajo Mountains of Arizona by E. D. Ball on July 23, 1937. Holotype male, allotype female, and one paratype in the United States National Museum. One male and one female paratype retained in the Snow Entomological Collections.

Mistharnophantia angusta n. sp.

(Plates I, II, III)

Size. Length of male from apex of head to tip of posterior claval suture 4 mm.; from tip of claval suture to tip of tegmen 1.2 mm.; width of tegmen 2.2 mm. Female from apex of head to tip of posterior claval suture 5 mm.; from tip of claval suture to tip of tegmen 1.3 mm.; width of tegmen 2.4 mm.

Color. General body color rusty brown with dark fuscous markings along longitudinal veins and other areas as follows: a broad fuscous stripe that runs from tip of head to tip of mesonotum, this stripe broader on mesonotum; three blackish fuscous dots on the gena in front of the eye and larger dark fuscous mark behind the eye; 2nd anal vein conspicuously dark; the posterior half of cell 1st A and all of cell 2nd A blackish brown thus making a broad dark stripe along commissural margin; cauda dark brown. Anterior part of frons is blackish, clypeus is reddish, legs are yellowish with dark markings on the tibia, and antennae are dark with tip of pedicel yellow.

Structural Characteristics. Vertex three times as wide as median length, anterior margin in line or slightly anterior to front line of eye, conspicuously depressed on disk. Dorsal part of frons with sharply depressed circu-

lar central depression; median length almost twice median length of vertex; from below frons slightly wider than long, bluntly rounded anteriorly, lateral margins forming an obtuse angle near lower part of eye, sides rolled slightly forward. Viewed from the side the dorsal margin of frons slopes ventrad at the tip which makes the tip of head angulately rounded. Pronotum two and one-half times as wide as vertex and about one-half as long as mesonotum, its anterior margins extending to middle of eye. Mesonotum with two elevated outwardly curved carinae, the disk between them flattened, lateral sides depressed, apex pointed. Tegmen rugged due to greatly elevated veins and granulose areas, a large granulose area at base of clavus and smaller area on central part of corium. The costal veins conspicuous, being heavily marked with fuscous. The costal area of the tegmina overlaps the segments of abdomen. Cauda more spatulate than in *sonorana*, less pointed apically, not suddenly constricted at tip of clavus but with posterior margin of tegmen straight, but cauda itself elevated. The venation of tegmen is as follows: Sc₁ following expanded costal margin to about half the length of tegmen; Sc₂ runs across the elevation then branches to meet Sc₁ in costal margin; R runs for short distance with Sc₂ then branches in front of elevation into two main branches; M two-branched; Cu₁ runs along claval suture, then swings down a little in the middle; Cu₂ forms the claval suture; 1st A runs for a short distance in middle of clavus, then joins 2nd A, the latter elevated, forming the hump on the clavus after which the combined veins extend to the posterior tip of claval suture; veins in cauda and along posterior margins breaking up into indistinguishable reticulation.

Male Genitalia. The aedeagal structure is asymmetrical. The aedeagus proper is entirely hidden by the sleeve-like theca which in this species is extended beyond the posterior end of the aedeagus. On the left side the theca bears a slender sclerotized hook which at base is twice wider than in middle and which extends eight-ninths of the thecal length. On right side is found another sclerotized hook which at base is three times wider than in middle and extends one-fifth of the thecal length, both hooks having sharp apices.

Comparative Notes

This species closely resembles *Mistharnophantia sonorana* Kirk. but it is much darker and slightly darker than *Mistharnophantia sima*. The frons from dorsal view is twice as wide as vertex while in *M. sonorana* the dorsal median length of frons is less or subequal to that of *angusta*. The cauda is more spatulate and not so abruptly narrowed as in *sonorana*.

Location of Types and Geographical Notes

Holotype male, and two male paratypes, Marathon, Texas, July 10, 1938, R. H. Beamer. Allotype female and five male paratypes, Ft. Stockton, Texas, July 11, 1936, R. H. Beamer. Other paratypes: one male, Marathon, Texas, July 9, 1938, R. H. Beamer; one male, same place, July 10, 1938, D. W. Craik; two males, Ft. Stockton, Texas, July 11, 1936, J. D. Beamer; four males, same place and date, D. H. Lindsay. All above types in Snow Entomological

Collections. Additional paratypes in the United States National Museum; four females and one male, Carlsbad, New Mexico, August 6, 1936, E. D. Ball.

Mistharnophantia curta n. sp.

(Plates I, II, III)

Size. Length from apex of head to posterior tip of claval suture on commissural margin 3.5 mm. From tip of claval suture to tip of tegmen .62 mm. Length of tegmen 3.25 mm.; width of tegmen 2.25 mm.

Color. General body color dirty yellowish with a greenish cast and dark brownish markings. Males darkened as follows: a broad dark brownish stripe that runs from tip of head to tip of mesonotum; brownish areas along longitudinal veins; depressed oval area in center of clavus; three black spots on gena in front of eye; frons is olive green to light brownish with the sides streaked with brownish markings. Female with above dark markings more pronounced in addition to a brown arc followed by a lighter one in center of posterior half of tegmen.

Structural Characteristics. Vertex three and a half to four times wider than median length, somewhat rectangular, its lateral margins diverging anteriorly, its median length longer than median length of frons exposed from above, slightly carinate in middle. Frons from above has a curved carina near anterior margin of head, a slight depressed area anterior to the vertex. Frons viewed from below shows its greatest length and its greatest width equal; basal margin, bluntly rounded, disk concave; from side view it extends forward not more than one and one-half times the length of the gena, therefore indicating a shorter head than in other species. Pronotum with anterior margin roundly produced and its posterior margin shallowly concave, its median length is equal to the combined length of vertex and dorsal part of frons. Mesonotum slightly more than twice as long as the pronotum with two slightly elevated outwardly curved carinae, the disk between them slightly depressed. Tegmina about one-fourth longer than head; cauda bluntly shortened, its length less than one-third of the clavus, only slightly elevated. The venation of tegmen is as follows: Sc₁ following expanded costal margin for two-thirds the length of wing then converging with Sc₂ just before caudal margin; Sc₃ branched before middle of wing; R and M branches reticulated posterior to middle of wing; Cu₁ follows along claval suture then branches; M forms the venation of the cauda; 1st A runs along the clavus then follows along together to end of claval suture.

Male Genitalia. Each harpago as viewed from a lateral view is a convex rectangular plate which is twice longer than wide at a point just anterior to dorsal hook. The hook is about two-thirds the width and extends dorsad, its apex bent again anteriorly. The aedeagal structure is asymmetrical. The aedeagus proper is entirely hidden by the sleeve-like theca. On the left side which is on the opposite side than in *sonorana* the theca bears a sclerotized hook which at base is twice wider than in the middle and which extends two-thirds the thecal length; on the right side is found another sclerotized curved hook which is about one-half the thecal length. Both have sharp apices.

Comparative Notes

This species closely resembles *M. ajoensia* having the cauda shortened, its length not more than one-sixth total dorsal length of body and only slightly elevated. The two species can be separated as follows: the median length of vertex is greater than the dorsal part of frons in *curta*; in *M. ajoensia* the vertex is less than the median dorsal length of frons; the apex of frons in *curta* is bluntly produced, in *ajoensia* roundly produced. In *ajoensia* median length of frons is less than in its greatest width, while in *curta* the greatest length and width are equal. The venation of the tegmen is similar with the anterior branches forming reticulation which makes it impossible to trace their branching.

Notes on Distribution and Location of Types. This species was described from six specimens collected at Kino Bay, Mexico by E. D. Ball, Dec. 9 (year not recorded). Holotype male, allotype female, one paratype male and one paratype female in the United States National Museum. One paratype male and one paratype female retained in the Snow Entomological Collections.

Mistharnophantia extensa n. sp.

(Plates I, II, III)

Size. Length from apex of head to posterior tip of claval suture 4.25 mm.; from tip of claval suture to tip of tegmen 1.25 mm.; length of tegmen 3.5 mm.; width of tegmen 2.75 mm.

Color. General color of body and tegmen of male uniformly testaceous, only the cauda dark brown. Female darker, clouded with fuscous as follows: a broad brown stripe on mesonotum faintly indicated, base of frons and the usual depressed oval area in center of clavus reddish brown, a large irregular marking in the form of the letter C with curved side next the claval suture and about eight or nine round light brown spots between the C and costal margin, cauda blackish brown with thick veins reddish brown.

Structural Details. Anterior margin of vertex straight, its median length subequal to median length of frons; its lateral margin is distinctly longer, almost one-third greater than median length of frons so that vertex, on first glancing at head, is a conspicuous rectangle; the anterior margin of vertex is slightly concave, a median carina is distinctly present and the lateral margins diverge anteriorly. From above disk of frons depressed; from below its greatest length is equal to its greatest width, the basal margin sharply rounded and anterior margin concave. Pronotum with median length about twice length of frons, roundly produced anteriorly to the middle of the eye, a slight median carina present. Mesonotum is equal to the combined length of head and pronotum; it has two laterally curved carinae with depressed area between; and the tip is pointed. Tegmina elongate, posterior half of male tegmen abruptly narrowed, but cauda itself spatulate, not constricted abruptly at apex of clavus, elevated about one-fourth of the total dorsal length.

The venation of tegmen is as follows: Sc_1 following expanded costal margin to about half the length of tegmen; Sc_2 runs across the elevation then branches to meet Sc_1 in costal margin; R is apparently two-branched; M two-branched with its outer branches extending to the tip of tegmen; Cu_1 runs close to claval suture then branches in the tip of tegmen; Cu_2 forms claval suture; 1st A runs along middle of clavus and 2nd A near commissural margin, meeting toward the posterior portion of claval suture.

Male Genitalia. Each harpago as viewed from a flattened lateral view is a convex semicircle which is about one-third longer than wide at a point just anterior to dorsal hook. The hook is about one-half the width and bends anteriorly and dorsad. The aedeagal structure is asymmetrical with the thecal hooks in the same respective position as in *sonorana*. The aedeagus proper is entirely hidden by the sleeve-like theca which in this species has a conspicuous overlapping posterior lobe protruding over the base of the thecal hook. On the right side the theca bears a slender sclerotized hook, which extends about two-thirds the thecal length. In other species except *sonorana* this long hook is on the left side. On the left side is found another sclerotized hook which is shorter and heavier at the base where it then forms an acute angle in the middle which is half membranous and half sclerotized, giving it a more slender appearance than in other species, after which it bulges slightly, finally tapering to a sharp apex. This short hook in other species except *sonorana* is on the right side.

Comparative Notes

This is a distinctive species in color and general shape of tegmen. The male specimens are testaceous, thus superficially resembling *sonorana* and *acuta* but are distinguished by the contrasting brown cauda. The female is distinguished by the inverted "C" marking on posterior half of corium. Structurally the species seems closer to *angusta* since both have the straight posterior margin of tegmen with spatulate cauda. The two are separated by the fact that the cauda of *extensa* is more spatulate while in *angusta* it is more lanceolate; the length of head and pronotum is equal to length of mesonotum in *extensa*, while in *angusta* the mesonotum is larger; the dorsal median length of frons in *angusta* is much longer to median length of vertex and the general color of *angusta* is dark fuscous while in *extensa* a general light tone is characteristic except for contrasting brown markings as described above.

Notes on Distribution and Location of Types. This species was described from numerous specimens taken at the following places: holotype male, Arizona, C. F. Baker; allotype female and three female paratypes, Yuma, Arizona, August 25, 1929, E. D. Ball; one male and one paratype female, Kino Bay, Mexico, December 8, E. D. Ball; two females, Comstock, Texas, August 9, 1936, E. D. Ball. All above types are in the United States National Museum.

Other paratypes in the Snow Entomological Collections are: two females and two males, Ugnacio, Texas, August 5, 1938; two females and four males,

Alamo, Arizona, August 14, 1935; one female and two males, Tularosa, New Mexico, July 1, 1940; two females and one male, Malaga, New Mexico, August 11, 1936; one male, Arivaca, Arizona, July 25, 1933; two females, Nogales, Arizona, July 25, 1933; all collected by R. H. Beamer. Other paratypes are: four females, Cochise, Arizona, August 24, 1935, Jean Russell, and one female, Brewster Co., Texas, June 17, 1908, Mitchell Cushman.

Mistharnophantia sima n. sp.

(Plates I, II, III)

Size. Length of female from apex of head to tip of posterior claval suture on commissural margin 4.5 mm.; from the tip of claval suture to tip of tegmen 1.5 mm.; length of tegmen 5 mm.; width of tegmen 2.8 mm. Male from apex of head to tip of posterior claval suture 4 mm.; from the tip of claval suture to tip of tegmen 1.2 mm.; width of tegmen 2.5 mm.

Color. General color of body and tegmina brown with an olive green caste in spots, an irregular reddish brown stripe extends from a point just inside tip of head to apex of mesonotum, rest of head and thorax mottled. Postclypeus reddish brown across basal half becoming greenish across apex, anteclypeus tawny. Genae greenish. Tegmina tannish brown with vein 2nd A and apical branches of other longitudinal veins dark blackish brown, cauda darker brown than rest of tegmen and a conspicuous depressed brown area midway of clavus, this area outlined by a curved black marking starting midway of 2nd A vein. 1st A curving posteriorly to the point of joining of veins 1st A and 2nd A, the lower part of the depression viewed from dorsal side blackish brown, the combined depressed areas of the two wings giving the appearance of having been pinched by the thumb and finger of the hand. Female darker and more heavily marked with fuscous than the male. Legs uniform yellowish tan.

Structural Characteristics. Vertex semi-rectangular, its lateral margins diverging anteriorly, its median length approximately equal to median length of frons exposed from above and its lateral margin subequal to median length of frons, slightly carinate in middle. Frons with anterior portion bulbous, posterior part sharply concave, sides expanded and slightly rolled forward, greatest length and greatest width subequal, as viewed from the side frons extends forward twice the length of gena in front of the eye, the females particularly having a snub-nosed appearance, the gena itself extended in front of eye a distance one-half length of eye. Median length of clypeus equal to median length of frons on ventral side. Eyes snugly adjoining lateral corner of pronotum, their width a little less than half width of vertex. Pronotum with anterior margin somewhat squarely roundly produced and its posterior margin shallowly concave, its length through middle approximately one-half of the length of mesonotum. Mesonotum with two slightly elevated outwardly curved carinae, the disk between them depressed posteriorly.

The anterior portion of tegmina with 2nd A vein elevated starting in line with apex of mesonotum. Tegmen of female boat-shaped, with the anal area

tip pointed backward and the entire apical margin angulately concave. The male costal margin is more rounded than in the female, and the lanceolate cauda in the male is pointed upward making almost a direct line from tip of tegmen to the broad part of tegmen which gives a characteristic appearance of resembling an English sparrow. Vein Sc_2 elevated into a conspicuous hump at a point in line with apex of mesonotum.

The venation of tegmen is as follows: Sc_1 following expanded costal margin almost entire length of tegmen; Sc_2 runs across the elevation then branches to meet Sc_1 at the broadest portion of wing; R is apparently two-branched; M two-branched; Cu_1 runs adjacent to claval suture; Cu_2 forms the claval suture; 1st A runs along middle of clavus and 2nd A near commissural margin, meeting in the center of the clavus then running together to the end of claval suture. Each tegmen has a pimple-like area under the hump on commissural margin, also three smaller areas, one on side of subcostal elevation, one posterior to the depressed area on commissural margin, and one below R_2+3 .

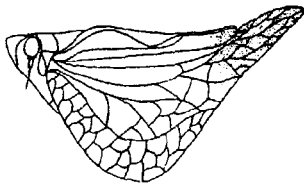
Male Genitalia. Each harpago viewed from flattened lateral view is a convex semicircular plate which is four times longer than wide at a point just anterior to dorsal hook. The hook is about two-thirds the width and bends anteriorly and toward concave side. The aedeagal structure is asymmetrical. The aedeagus proper is entirely hidden by the sleeve-like theca which in this species has a conspicuous overlapping posterior lobe protruding over base of the thecal hook. On the left side the theca bears a sclerotized hook which at base is three times wider than in middle and which in length is three-fourths of the thecal length. On the right side is found another sclerotized, posteriorly directed hook which is about one-half the length of the right hook. Both hooks with sharp apices.

Comparative Notes

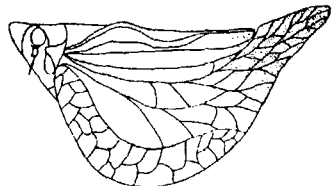
This species closely resembles *M. sonorana*. It is distinguished by its darker coloring, more bulbous, snub-nosed frons and elevated cauda.

Notes on Distribution and Location of Types. This species was described from numerous specimens. Holotype, male, allotype female and five male and six female paratypes, Laredo, Texas, June 3, 1933, P. W. Oman. Other paratypes: four males and three females, Castle Springs, Arizona, August 4, 1941, R. H. Beamer; three females from Mt. Spring, California, July 25, 1938, R. H. Beamer; four females, Catarina, Texas, June 3, 1933, P. W. Oman; two males, Alamo, Arizona, August 14, 1935, Jean Russell; one male, Talfuria, Texas, January 1, 1946, R. H. Beamer; three females, Bradshaw Mts., Arizona, August 27, 1935, E. D. Ball; one male and two females, N. Laredo, Mexico, August 31, 1936, E. D. Ball; one male, Leeds, Utah, August 9, 1936, R. H. Beamer.

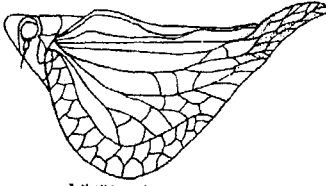
Types and some paratypes in the United States National Museum; other paratypes in the Snow Entomological Collections.



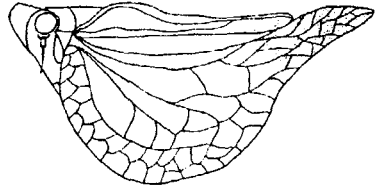
1 *Mitharnophantia sonorana*



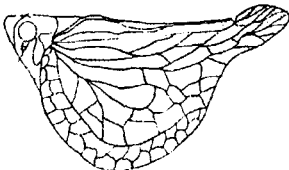
2 *Mitharnophantia sonorana*



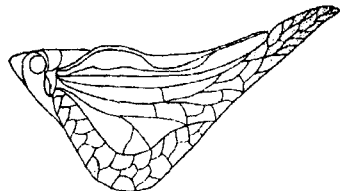
3 *Mitharnophantia sima*



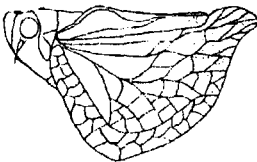
4 *Mitharnophantia sima*



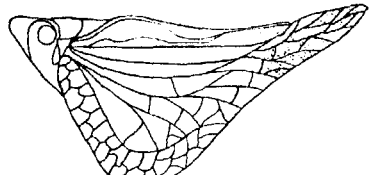
5 *Mitharnophantia ajoensis*



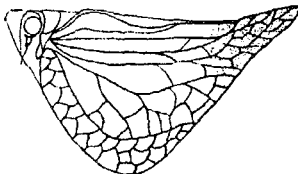
6 *Mitharnophantia ajoensis*



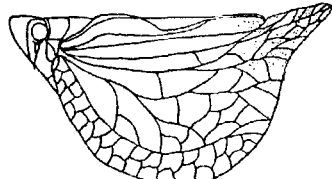
7 *Mitharnophantia curta*



8 *Mitharnophantia curta*



9 *Mitharnophantia acuta*



10 *Mitharnophantia acuta*

Plate I

(Plates I, II, III)

1. Lateral view of male of *Mitharnophantia sonorana* Kirk.
2. Lateral view of female of *Mitharnophantia sonorana* Kirk.
3. Lateral view of male of *Mitharnophantia sima* n. sp.
4. Lateral view of female of *Mitharnophantia sima* n. sp.
5. Lateral view of female of *Mitharnophantia ajoensis* n. sp.
6. Lateral view of male of *Mitharnophantia ajoensis* n. sp.
7. Lateral view of female of *Mitharnophantia curta* n. sp.
8. Lateral view of male of *Mitharnophantia curta* n. sp.
9. Lateral view of male of *Mitharnophantia acuta* n. sp.
10. Lateral view of female of *Mitharnophantia acuta* n. sp.

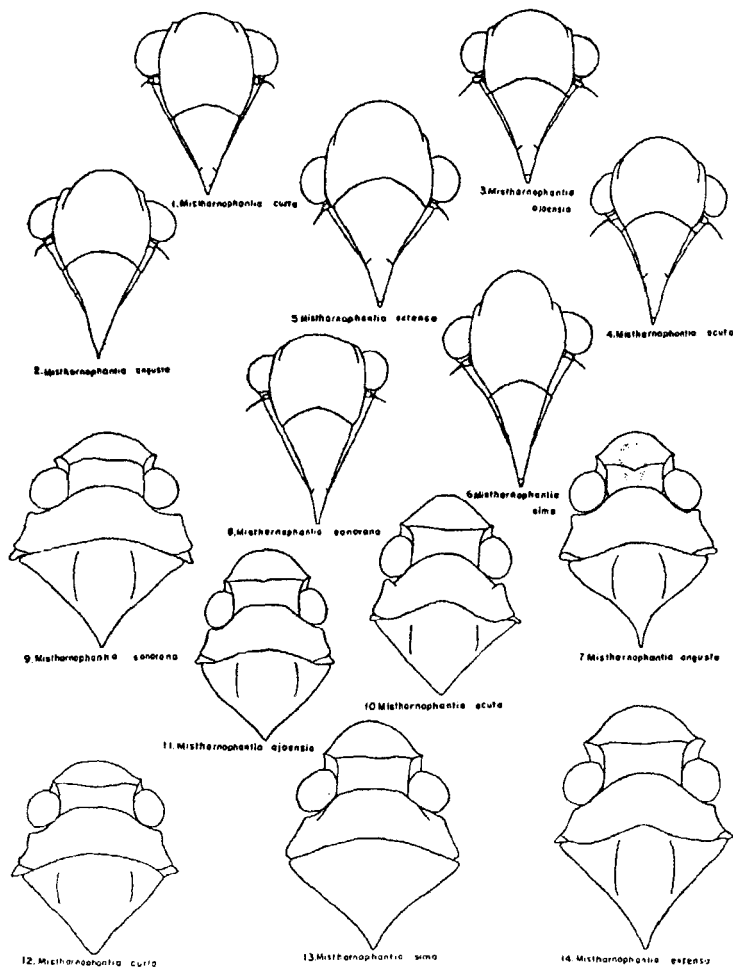


Plate II

1. Cephalo-ventral aspect of head of *Mistharnophantia curta* n. sp.
2. Cephalo-ventral aspect of head of *Mistharnophantia angusta* n. sp.
3. Cephalo-ventral aspect of head of *Mistharnophantia ajoensia* n. sp.
4. Cephalo-ventral aspect of head of *Mistharnophantia acuta* n. sp.
5. Cephalo-ventral aspect of head of *Mistharnophantia extensa* n. sp.
6. Cephalo-ventral aspect of head of *Mistharnophantia sima* n. sp.
7. Dorsal view of head and thorax of *Mistharnophantia angusta* n. sp.
8. Cephalo-ventral aspect of head of *Mistharnophantia sonora* Kirk.
9. Dorsal view of head and thorax of *Mistharnophantia sonora* Kirk.
10. Dorsal view of head and thorax of *Mistharnophantia acuta* n. sp.
11. Dorsal view of head of thorax of *Mistharnophantia ajoensia* n. sp.
12. Dorsal view of head and thorax of *Mistharnophantia curta* n. sp.
13. Dorsal view of head and thorax of *Mistharnophantia sima* n. sp.
14. Dorsal view of head and thorax of *Mistharnophantia* n. sp.

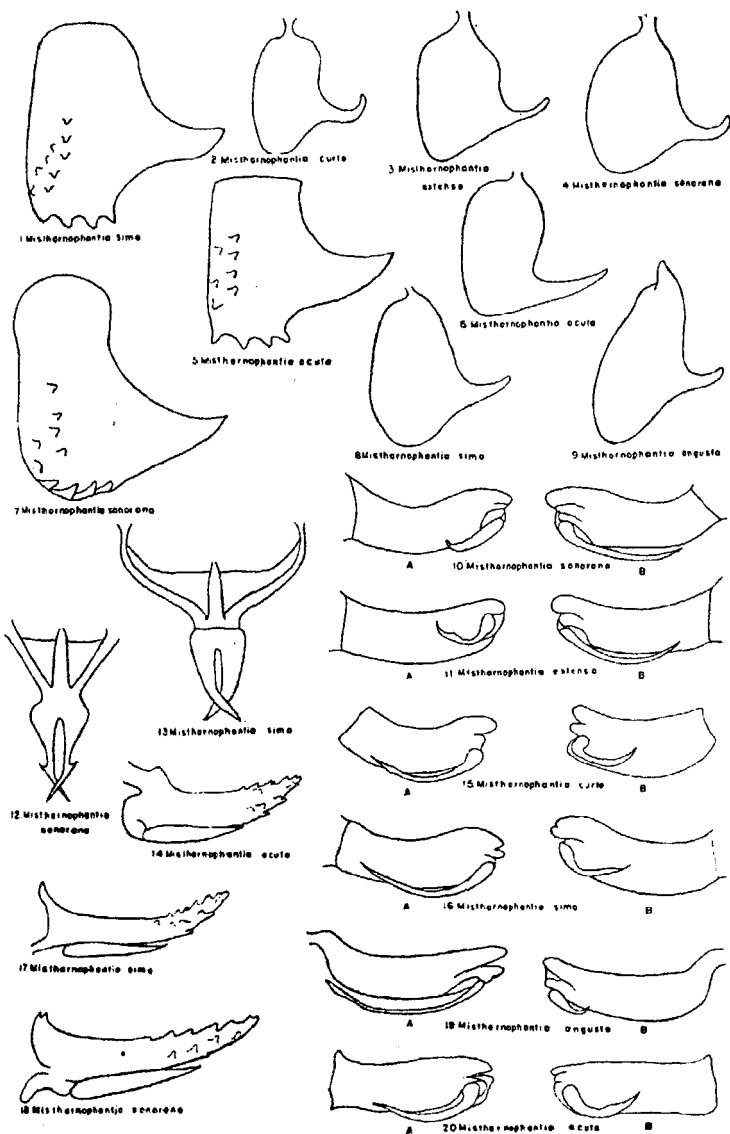


Plate III

1. Lateral valve of ovipositor of *Mistharnophantia sima* n. sp.
 2. Lateral aspect of harpago *Mistharnophantia curta* n. sp.
 3. Lateral aspect of harpago *Mistharnophantia extensa* n. sp.
 4. Lateral aspect of harpago *Mistharnophantia sonorana* Kirk.
 5. Lateral valve of ovipositor of *Mistharnophantia acuta* n. sp.
 6. Lateral aspect of harpago of *Mistharnophantia acuta* n. sp.
 7. Lateral valve of ovipositor of *Mistharnophantia sonorana* Kirk.
 8. Lateral aspect of harpago of *Mistharnophantia sima* n. sp.
 9. Lateral aspect of harpago of *Mistharnophantia angusta* n. sp.
 10. (A) Lateral left view of aedeagus and theca of *Mistharnophantia sonorana* Kirk.
(B) Lateral right view of aedeagus and theca of *Mistharnophantia sonorana* Kirk.
 11. Lateral left view of aedeagus and theca of *Mistharnophantia extensa* n. sp.
 12. Rudimentary anterior valve of *Mistharnophantia sonorana* Kirk.
 13. Rudimentary anterior valve of *Mistharnophantia sima* n. sp.
 14. Lateral aspect of ovipositor of *Mistharnophantia acuta* n. sp.
 15. (A) Lateral left view of aedeagus and theca of *Mistharnophantia curta* n. sp.
(B) Lateral right view of aedeagus and theca of *Mistharnophantia curta* n. sp.
 16. (A) Lateral left view of aedeagus and theca of *Mistharnophantia sima* n. sp.
(B) Lateral right view of aedeagus and theca of *Mistharnophantia sima* n. sp.
 17. Lateral aspect of ovipositor of *Mistharnophantia sima* n. sp.
 18. Lateral aspect of ovipositor of *Mistharnophantia sonorana* Kirk.
 19. (A) Lateral left view of aedeagus and theca of *Mistharnophantia angusta* n. sp.
(B) Lateral right view of aedeagus and theca of *Mistharnophantia angusta* n. sp.
 20. (A) Lateral left view of aedeagus and theca of *Mistharnophantia acuta* n. sp.
(B) Lateral right view of aedeagus and theca of *Mistharnophantia acuta* n. sp.
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