TWO NEW SPECIES OF KLEPTOPARASITIC *MYSMENOPSIS* (ARANEAE, MYSMENIDAE) FROM JAMAICA

Frederick A. Coyle and Thomas E. Meigs

Department of Biology
Western Carolina University
Cullowhee, North Carolina 28723 USA

ABSTRACT

Two new species of kleptoparasitic *Mysmenopsis* spiders (*M. monticola* and *M. furtiva*) from Jamaica are described; diagnoses and natural history data are also provided. These sister species appear to have coevolved with their respective host populations of *Ischnothele*, also each other's closest relatives. The probable close relationship of this *Mysmenopsis* species pair to *M. tibialis* (Bryant) is discussed.

INTRODUCTION

As defined by Platnick and Shadab (1978), *Mysmenopsis* includes 18 known species of tiny tropical and subtropical American mysmenid spiders with cusps attached distally to the male palpal tibia. These spiders are of special interest because at least some of them live as kleptoparasites (food stealers) in the funnelwebs of diplurid spiders (Platnick and Shadab 1978; Vollrath 1978). In this paper we describe two new *Mysmenopsis* species, which the first author, in the course of research on the systematics of ischnotheline diplurids, recently discovered living in *Ischnothele* webs in Jamaica. We also discuss the relationships of these new species and include observations on their natural history.

RELATIONSHIPS

The large number of character states shared by these two Jamaican *Mysmenopsis* species, including many similarities in male and female genital characters, clearly indicates that these are sister species. Several female character states, in particular, are probably synapomorphic for these two species: 1) a pair of spherical spermathecal chambers on each side of the epigynum (Figs. 16, 31), 2) comma-shaped posterior spermathecal lobes (Figs. 16, 31), 3) epigynal apex somewhat keel-shaped dorsally (Figs. 16, 31), 4) a rough retrolateral protuberance at distal end of femur I (Figs. 11, 27, 28), and 5) the absence of spines on metatarsus I. It is important to point out that each of these species was found living with a different member of a pair of undescribed allopatric *Ischnothele* morphs which also appear to be sister species (differing in color, habitat, and very few morphological traits) (Coyle in preparation). This appears to be the first clear

evidence for the kind of host-symbiont cospeciation process which Platnick and Shadab (1978) suggested might play a role in *Mysmenopsis* evolution.

Of all the previously described species of *Mysmenopsis, M. tibialis* (Bryant) is most similar to, and consequently seems most closely related to, these Jamaican species; however we should point out that our failure to examine specimens of any *Mysmenopsis* species other than *M. tibialis* [we relied upon Müller (1987), Platnick and Shadab (1978), and earlier descriptions] and the fact that males of some *Mysmenopsis* species are unknown make this hypothesis especially tentative. The following character states appear to be synapomorphies uniting the Jamaican species and *M. tibialis* [the unknown males of *M. wygodzinskyi* and *M. schlingeri,* which in Platnick and Shadab's (1978) cladogram form a trichotomy with *M. tibialis,* may be found to share some of these apomorphies]: 1) epigynum on end of pleated lobe (Figs. 5, 6, 17, 18, 32, 33), 2) embolar base sharply delimited from bulb (Figs. 9, 25), 3) male palpal patella with distal retrolateral keel (Figs. 9, 10, 25, 26), 4) sperm duct of palpal organ with a distinctive pattern of loops (Figs. 9, 25), and 5) cusps on male palpal tibia greatly reduced or lost.

The examination of *M. tibialis* types revealed that the palpal sperm duct is looped as in the Jamaican species (Figs. 9, 25), not as shown in Platnick and Shadab's (1978) fig. 59 of a paratype palp. Also, we could not see (using the dissecting microscope at 100 and 200X magnification) the small cusps illustrated by Platnick and Shadab (1978, fig. 59) on the inside of the tibial ledge. We suggest that the absence of tibial cusps in the Jamaican species is not plesiomorphic but the result of a secondary loss, and that the very small cusps of *M. tibialis* (if present) represent a stage in that loss process. We have redrawn the epigynum of *M. tibialis* (Figs. 5-7) to reveal more clearly than in the illustrations of Bryant (1940) and Platnick and Shadab (1978) some of the character states which suggest a close relationship to the Jamaican species.

Our hypothesis that *M. tibialis* is the sister species of the two Jamaican species is in conflict with synapomorphies 6 and 7 in Platnick and Shadab's (1978) cladogram. If their interpretation of those two character states is valid and if our hypothesis is correct, it is necessary to postulate that the anterior spermathecal ducts and female metatarsus I spines were reduced or lost in the ancestor of the Jamaican species.

Platnick and Shadab (1978) suggested that *M. palpalis,* which they placed in a clade with *M. tibialis* and two other species, may be misplaced and belong instead to a clade of six species which includes *M. cidrelicola,* because, of the five *Mysmenopsis* species known to be kleptoparasites, *M. palpalis* was the only one not in the *M. cidrelicola* clade. Given the evidence that the two new kleptoparasitic species are probably members of the *M. tibialis* clade, it is no longer necessary to suggest on the basis of kleptoparasitic habits that *M. palpalis* is misplaced (although it may eventually prove to be misplaced on the basis of other characters). Based upon the kleptoparasitic nature of the Jamaican species, we predict that *M. tibialis,* and perhaps *M. schlingeri* and *M. wygodzinskyi,* will prove to be kleptoparasites.

METHODS

The quantitative characters used in this study are abbreviated and defined as follows: BL, total body length; CL, carapace length; CW, carapace width; SL, sternum length; SW, sternum width; IFL, ITL, IML, and ITarL, lengths of leg I

articles; ITX, distance along longitudinal axis of male tibia I from perpendicular line through distal edge of tibial spur tubercle base to perpendicular line through proximal point of articulation; IFT, maximum diameter of male femur I; ITT, diameter of male tibia I at distal edge of tibial spur tubercle base; ITS, distance from tip of male tibial spur to distal edge of its tubercle base; PTW, maximum width of male palpal tibia perpendicular to longitudinal axis of cymbium; EBW, maximum width of embolus base; DTA, distance along longitudinal axis of female femur I from perpendicular line through ventral tubercle apex to proximal end of femur; FDT, maximum diameter of female femur I including ventral tubercle; HFT, height of female femur I tubercle (distance from tubercle tip to point of most abrupt slope change at junction of tubercle and edge of femur); EL, distance from posterior (distal) tip of epigynum to anterior edge of spermatheca chamber (Fig. 33); EPL, distance from anterior edge of spermatheca chamber to junction of dorsoposterior surface of epigynum with ventral surface of abdomen (Fig. 33); EW, width of epigynum at anterior (proximal) end of sclerotized plate (Fig. 17).

BL was measured in side view. All carapace and sternum measurements were performed from a ventral view with the lateral borders of the sternum in the horizontal plane. CW endpoints were at the intersections of the carapace edge and the retrolateral surface of legs II. The length of each leg I article was measured in retrolateral view and equals the distance from the proximal point of articulation to the most distal point of the article. IFT and PTW were measured from a retrolateral view. ITX was measured from an approximately retrolateral view with the tibial spur in the horizontal plane. ITT and ITS were measured from an approximately prolateral view with the tibial spur in the horizontal plane. DTA, FDT, and HFT were measured from a view between ventral and retrolateral with the ventral tubercle in the horizontal plane so that the HFT value was the maximum possible. IFT, ITT, FDT, and HFT were measured perpendicular to the longitudinal axes of their respective articles. EL and EPL were measured from a side view (left) of the abdomen; EW was measured from an approximately ventral view with the epigynum in the horizontal plane. All appendage measurements were recorded from the left appendage, unless it was damaged, missing, or not fully regenerated (in which case the right appendage was measured).

Measurements were performed with a Wild M-5 stereomicroscope with 20X ocular lenses and an eyepiece micrometer scale. BL measurements were performed at 50X and are accurate to 0.018 mm, and all other measurements were performed at 100X and are accurate to 0.009 mm. All measurements are given in millimeters.

Spermathecae were cleared in 85 percent lactic acid, viewed at 400X through a compound light microscope, and drawn with the aid of a drawing tube.

Each species description is a composite of all the adult specimens examined; these sample sizes are given in Tables 1 and 2. The quantitative character values recorded in these tables are an integral part of each description.

Mysmenopsis monticola, new species
Figs. 1-3, 8-23, 39-42

Types.—Male holotype and six male and 13 female paratypes collected in *Ischnothele* webs on roadbanks in humid mountain forest along road between
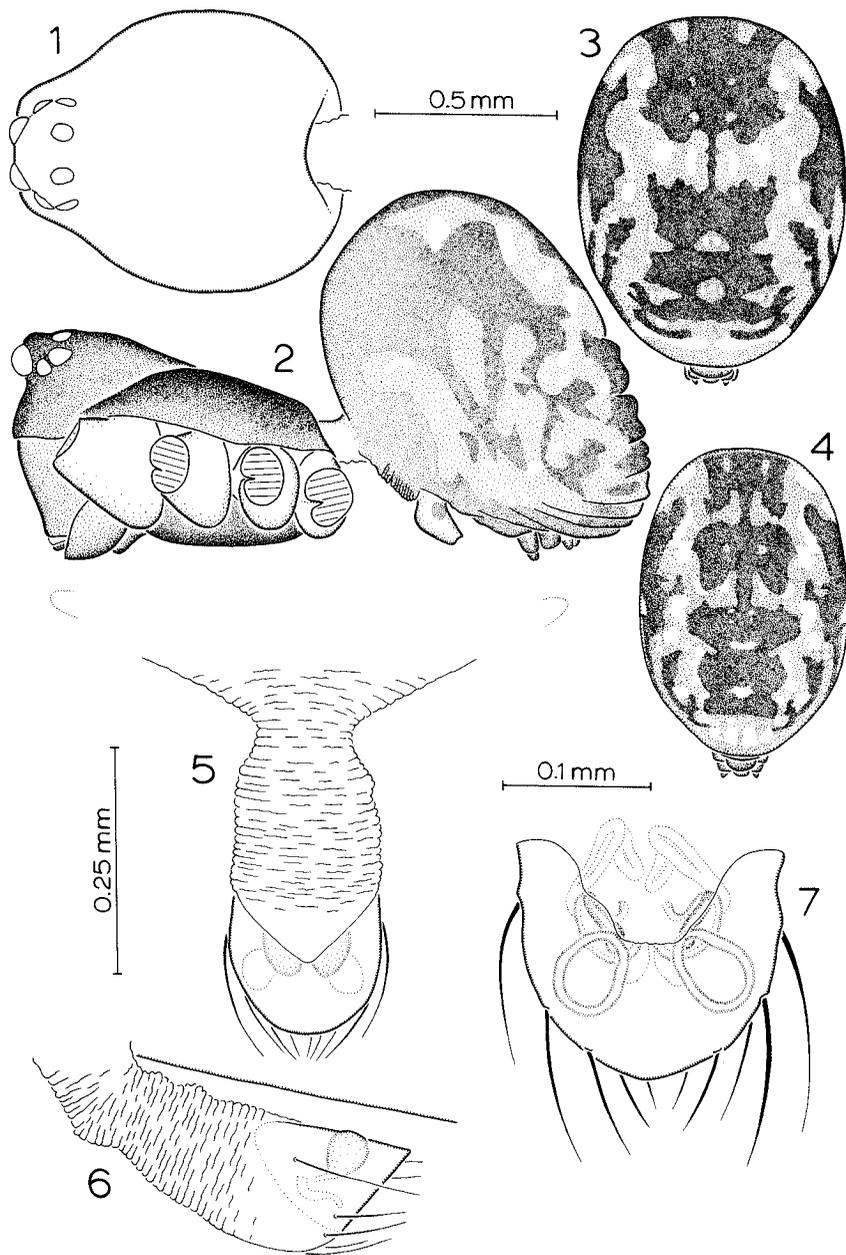
Figures 1-7.—*Mysmenopsis* spp.: 1-3, *M. monticola* paratypes; 1, female carapace, dorsal; 2, female body, lateral; 3, male abdomen, dorsal; 4, *M. furtiva* paratype male abdomen, dorsal; 5-7, *M. tibialis* paratype epigynum; 5, ventral; 6, lateral; 7, cleared, dorsal. Scale lines: 0.5 for Figs. 1-4; 0.25 for Figs. 5, 6; 0.1 for Fig. 7.

Newcastle (3800 ft elevation) and Hardwar Gap (4200 ft elevation), St. Andrews Parish, Jamaica (8 April 1988; F. Coyle, R. Bennett, and A. Robinson), deposited in the American Museum of Natural History.

    Etymology.—The specific name refers to the montane habitat of this species.

    Diagnosis.—Males of *M. monticola* can be distinguished from those of *M. furtiva* by the following differences: 1) The embolus base is wider (Fig. 9) [EBW

= 0.056; EBW(100)/PTW = 25-30, 26.8 ± 1.60] than in *M. furtiva* (Fig. 25) [EBW = 0.037; EBW (100/PTW = 22-24, 22.7]. 2) The embolus tapers more abruptly above its base in retrolateral view (Fig. 9) and is more evenly curved in ventral view (Fig. 10) than in *M. furtiva* (Figs. 25, 26). 3) The ventral ledge on the palpal tibia forms a proportionally larger lobe (Figs. 9, 10) than in *M. furtiva* (Figs. 25, 26). 4) The tibia I clasping spur (including the tubercle from which it arises) is longer (Figs. 8, 41) [ITS = 0.194-0.241, 0.213 ± 0.015; ITS(100)/ITT = 169-192, 180.9 ± 7.59] and more distal [ITX(100)/ITL = 84-89, 85.8 ± 1.59] than in *M. furtiva* (Figs. 24, 41) [ITS = 0.157-0.176, 0.167; ITS(100)/ITT = 150-158, 154.3; ITX(100)/ITL = 80-83, 81.0].

Females of *M. monticola* can be distinguished from those of *M. furtiva* by the following differences: 1) The femur I ventral tubercle (Figs. 11-14, 39, 40) is larger [HFT = 0.046-0.083, 0.055 ± 0.012; HFT (100)/IFL = 5.1-8.0, 6.38 ± 1.00], its proximal slope is much less steep, and it is more prolateral and distal [DTA(100)/IFL = 84-90, 86.8 ± 1.61] than in *M. furtiva* (Figs. 27-30, 39, 40) [HFT = 0.019-0.037, 0.026 ± 0.009; HFT(100)/IFL = 2.7-4.4, 3.42 ± 0.75; DTA(100)/IFL = 75-77, 75.9 ± 0.81]. 2) The rough swelling on the retrolateral side of the distal end of femur I (Fig. 11) is much less prominent than the homologous tubercle (Figs. 27, 28) in *M. furtiva*. 3) The epigynum is at the end of a pleated lobe which is usually broader and shorter (Figs. 17, 18) (EPL = 0.009-0.074, 0.031 ± 0.023) than in *M. furtiva* (Figs. 32, 33) (EPL = 0.065-0.278, 0.176 ± 0.071). 4) The epigynum has a pronounced distoventral expansion (Figs. 18-23) which is lacking in *M. furtiva* (Figs. 33-38). 5) The epigynal hairs extend beyond the end of the epigynum more than one-third of the length of the epigynum (Figs. 16-18) instead of much less than one-third the epigynal length (Figs. 31-33). 6) The lip of the epigynal opening is broad and well-sclerotized (Fig. 16), not U-shaped and very weakly sclerotized as in *M. furtiva* (Fig. 31).

Both sexes of *M. monticola* exhibit on the abdominal dorsum (Fig. 3) a light grey H-shaped pigment pattern that is different from the pattern of *M. furtiva* (Fig. 4) (see description).

The following characters best separate *M. monticola* and *M., furtiva* from their close relative, the Cuban species, *M. tibialis*, (see Platnick and Shadab 1978, figs. 59-64): 1) No apophysis arises from the embolus base (Figs. 9, 25) as in *M. tibialis*. 2) The ventral lobe-like ledge on the male palpal tibia (Figs. 9, 10, 25, 26) is not present in *M. tibialis*. 3) The male palpal patellar keel is broader, thinner, and sharper (Figs. 9, 25) than in *M. tibialis*. 4) The male tibia I spur is more sharply bent near its distal end and its tubercle is shorter (Figs. 8, 24) than in *M. tibialis*. 5) Female tibia I (Fig. 15) lacks the ventral tubercle and female metatarsus I (Fig. 15) lacks the spine row present in *M. tibialis*. 6) The female femur I ventral tubercle and distal retrolateral protuberance (Figs. 11, 27) are not present in *M. tibialis*. 7) Several differences exist in the form of the epigynum and spermathecae (Figs. 5-7, 16-18, 31-33).

Males.—Table 1. Figs. 3, 8-10, 41. Palpal patella with sharp distal keel on retrolateral surface. Palpal tibia with ventral ledge produced into rather large lobe; no cusps associated with this ledge. Embolus with relatively broad base; narrows abruptly above base; smoothly curved in S-shape, ending at distal edge of cymbium. Tibia I clasping spur attached to moderately short tubercle and bent distally. Legs with dark patches on pale tan background; coxae mostly unpigmented; femur I mostly dark, rest of femora with dark spot in middle and
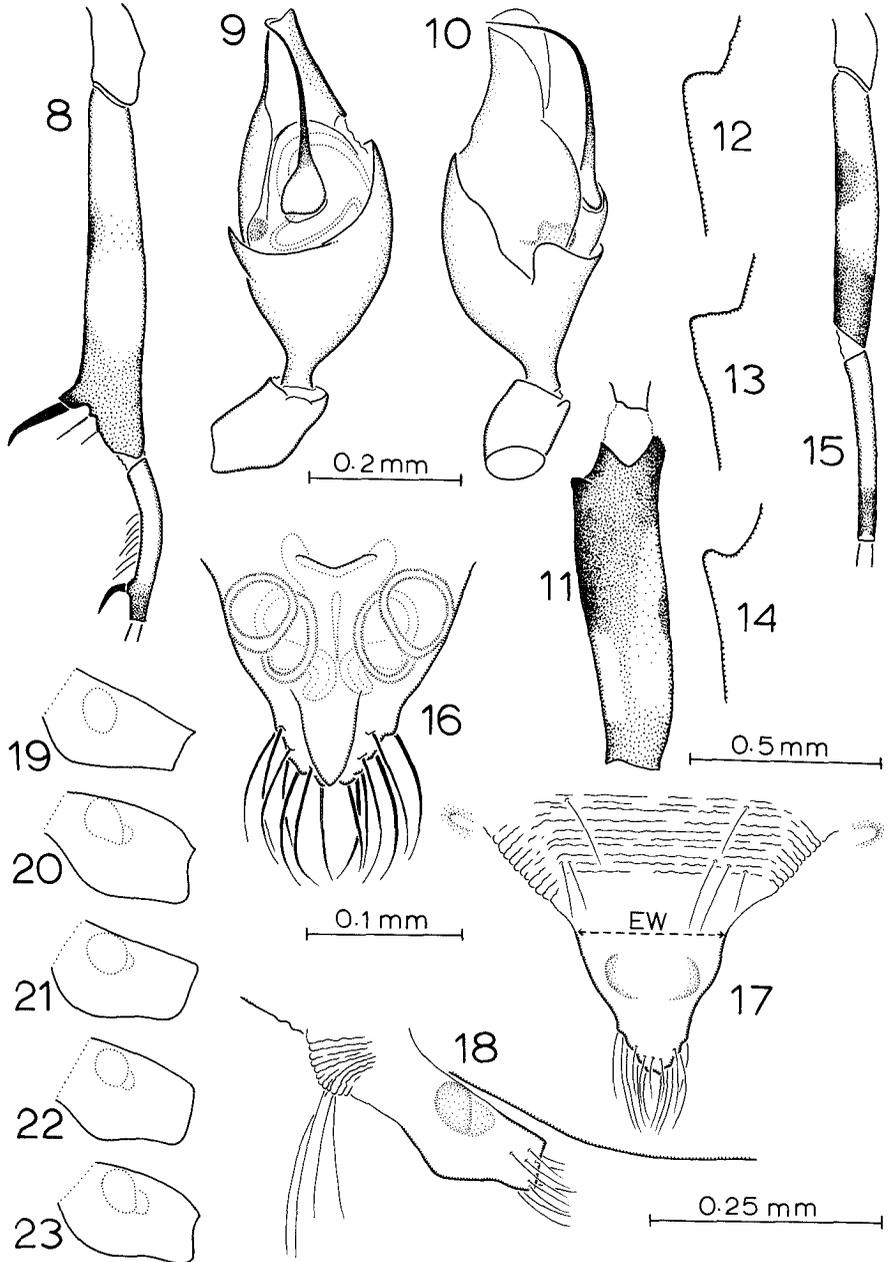
Figures 8-23.—*Mysmenopsis monticola*: 8-10, holotype male; 8, tibia and metatarsus I, approx. prolateral; 9, 10, palp; 9, retrolateral; 10, ventral; 11-23, paratype females; 11, femur I, ventral; 12-14, femur I ventral tubercle of three specimens, view between ventral and retrolateral; 15, tibia and metatarsus I, prolateral; 16-23, epigyna; 16, cleared, dorsal; 17, ventral; 18-23, lateral view of six specimens. Scale lines: 0.2 for Figs. 9, 10, 12-14; 0.5 for Figs. 8, 11, 15; 0.1 for Fig. 16; 0.25 for Figs. 17-23.

at both ends; patellae with dark spot; tibiae with dark spot in middle and distally; metatarsi with distal dark spot; tarsi unpigmented. Carapace and sternum dark grey. Abdomen with many areas of dark grey or black separated by areas of light

Table I.—Quantitative character values for *Mysmenopsis* males. Character abbreviations are defined in the methods section of the text. All measurements given in millimeters. Range, mean, and standard deviation given for samples larger than four.

	monticola (N=7)	*furtiva* (N=3)	*monticola* holotype	*furtiva* holotype
BL	1.39-1.72 (1.53±0.12)	1.33-1.55 (1.43)	1.61	1.41
CL	0.71-0.81 (0.748±0.038)	0.66-0.73 (0.688)	0.79	0.68
CW	0.59-0.70 (0.643±0.041)	0.56-0.62 (0.586)	0.68	0.58
SL	0.46-0.53 (0.486±0.029)	0.43-0.46 (0.441)	0.52	0.43
SW	0.44-0.51 (0.468±0.029)	0.42-0.45 (0.432)	0.51	0.43
IFL	0.81-1.06 (0.926±0.087)	0.76-0.84 (0.799)	1.06	0.80
ITL	0.69-0.88 (0.766±0.070)	0.64-0.70 (0.666)	0.88	0.66
IML	0.38-0.44 (0.404±0.021)	0.33-0.35 (0.342)	0.43	0.33
ITarL	0.42-0.45 (0.432±0.015)	0.34-0.35 (0.348)	0.45	0.34
ITX	0.57-0.75 (0.658±0.063)	0.51-0.56 (0.540)	0.75	0.55
IFT	0.185-0.305 (0.251±0.041)	0.222-0.259 (0.237)	0.296	0.231
ITT	0.111-0.129 (0.118±0.007)	0.102-0.111 (0.108)	0.130	0.111
ITS	0.194-0.241 (0.213±0.015)	0.157-0.176 (0.167)	0.241	0.167
PTW	0.185-0.222 (0.207±0.012)	0.157-0.167 (0.163)	0.213	0.167
EBW	0.056 (0.056±0.0)	0.037 (0.037)	0.055	0.037
ITX(100)/ITL	84-89 (85.8±1.5)	80-83 (81.0)	85	83
ITS(100)/ITT	169-192 (180.9±7.5)	150-158 (154.3)	186	150
EBW(100)/PTW	25-30 (26.8±1.6)	22-24 (22.7)	26	22

grey with white spots; dorsally, two prominent, longitudinal, winding light grey bands separated by dark central area except for one pair of broad median lobes of light grey that almost connect at median line to produce light grey "H" pattern.

Females.—Table 2. Figs. 1, 2, 11-23, 39, 40. Femur I with prominent tubercle on prolateral aspect of ventral surface near distal end; tubercle with gently sloping proximal face, steep distal face, and rounded apex; rough-surfaced retrolateral swelling at distal end of femur. Tibia I cylindrical. Metatarsus I without spines. Epigynum at end of short, broad, unsclerotized, pleated lobe; tip with rough rounded distoventral prominence and rather sharp and keel-like distodorsal prominence; hairs extend well beyond tip; spermathecae consist of pair of oval chambers with curved posterior median lobe on each side, and broad, well-sclerotized lip bordering opening on ventral surface of epigynum. Pigmentation similar to that of males.

Variation.—We found relatively little variation in any of the characters in this population sample except for EPL (Table 2). The extremely wide range of epigynum lobe lengths may be due to pronounced developmental plasticity and/ or use-induced changes during mating or oviposition. The pleated nature of the unsclerotized lobe suggests that it may be lengthened during these reproductive activities. Despite the wide range of EPL variation within both the *M. monticola* and *M. furtiva* samples, there is surprisingly little overlap between these samples. Variation in epigynum shape and femur I tubercle shape is illustrated by Figs. 18-23 and 12-14.

Natural history.—*Ischnothele* host webs were concentrated in or near humid forest on roadbanks ranging from low pebbly soil banks to tall rock outcrops and from heavily shaded and moist to more exposed and drier. The host population was quite dense; in two spots there were approximately 50 webs in a 6 m long by

Table 2.—Quantative character values for *Mysmenopsis* females. Character abbreviations are defined in the methods section of the text. All measurements given in millimeters. Range, mean, and standard deviation given.

	monticola (N=13)	furtiva (N=6)
BL	1.50-2.07 (1.67±0.13)	1.41-1.65 (1.51±0.08)
CL	0.73-0.87 (0.798±0.044)	0.65-0.79 (0.709±0.062)
CW	0.60-0.75 (0.660±0.048)	0.52-0.63 (0.569±0.047)
SL	0.47-0.57 (0.517±0.032)	0.41-0.50 (0.449±0.038)
SW	0.41-0.54 (0.467±0.039)	0.38-0.47 (0.419±0.037)
IFL	0.73-1.04 (0.867±0.090	0.65-0.89 (0.749±0.100)
ITL	0.55-0.78 (0.645±0.068)	0.49-0.68 (0.567±0.079)
IML	0.41-0.55 (0.472±0.039)	0.37-0.47 (0.409±0.044)
ITarL	0.42-0.47 (0.438±0.017)	0.34-0.40 (0.367±0.026)
DTA	0.63-0.92 (0.754±0.084)	0.49-0.68 (0.569±0.077)
FDT	0.194-0.287 (0.236±0.030)	0.167-0.231 (0.197±0.031)
HFT	0.046-0.083 (0.055±0.012)	0.019-0.037 (0.026±0.009)
EL	0.102-0.139 (0.117±0.012)	0.093-0.129 (0.108±0.014)
EPL	0.009-0.074 (0.031±0.023)	0.065-0.278 (0.176±0.071)
EW	0.111-0.148 (0.133±0.011)	0.102-0.120 (0.109±0.007)
DTA(100)/IFL	84-90 (86.8±1.6)	75-77 (75.9±0.8)
HFT(100)/IFL	5.1-8.0 (6.38±1.00)	2.7-4.4 (3.42±0.75)

1.5 m tall section of roadbank. The retreat tubes penetrated into rock crevises, soil cavities, moss, and leaf litter. The retreats opened out onto exposed capture webs composed of one or two roughly horizontal sheets and other non-horizontal sheets and strands anchored to surrounding substrate and plant surfaces. The average capture web area was about 400 square cm, but the largest webs covered about 1000 square cm.

M. monticola were observed in many of the larger *Ischnothele* webs. Typically three to six mysmenids were seen per inhabited web, but as many as twelve were counted in one web. They were always observed in the capture portion of the host web near the retreat mouth. Adults of both sexes were found together in some of the host webs. Several females were carrying (it was not clear which appendages were being used) very thin-walled (nearly transparent) and roughly spherical egg sacs about equal to their body volume. Three of these egg sacs were collected and examined. One was 1.18 by 1.54 mm in size and contained nine eggs ranging in size from 0.41-0.46 mm minimum diameter to 0.51-0.55 mm maximum diameter. The other two egg sacs each contained four unpigmented pre-emergent spiderlings, but these sacs had been torn open (probably during or shortly after capture) and therefore may not have contained their full complement of spiderlings.
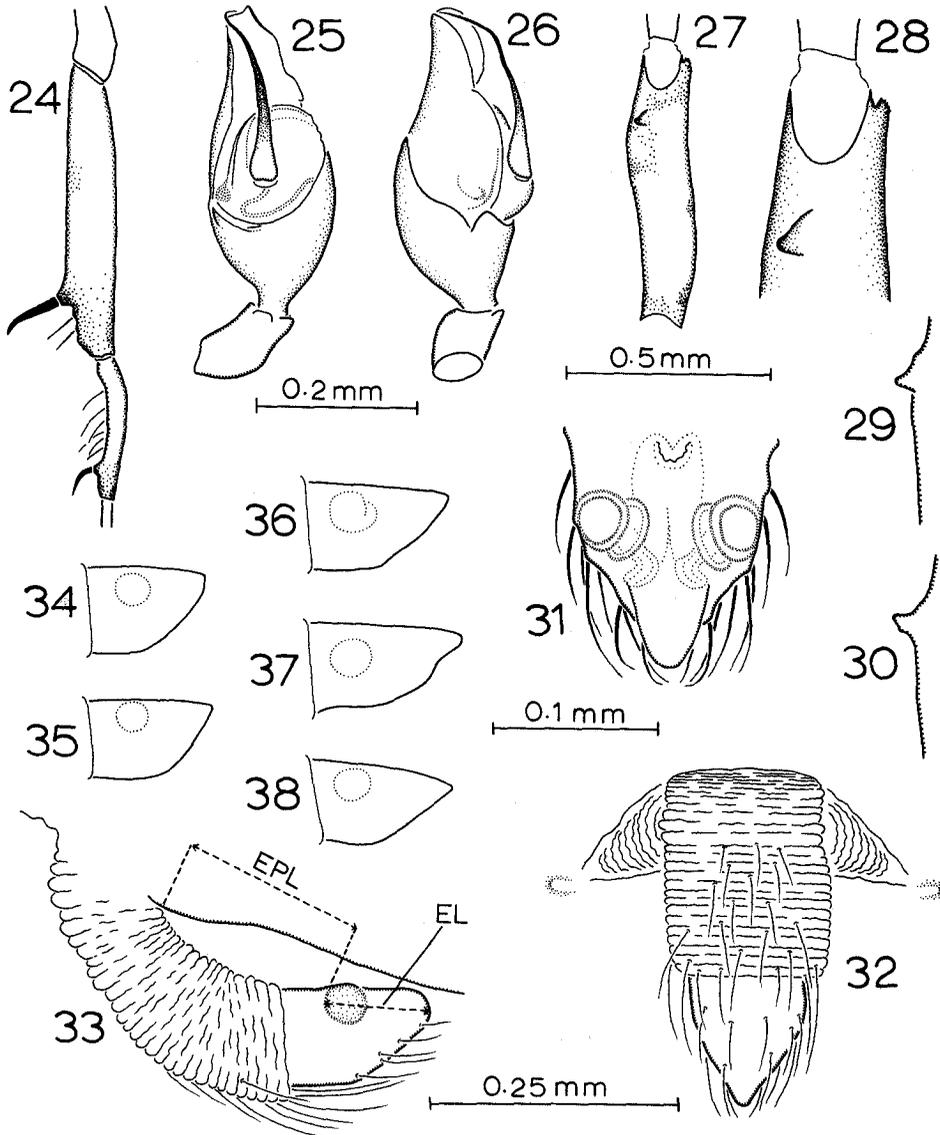
Distribution.—Known only from the type locality in the mountains of eastern Jamaica (Fig. 42).

Material examined.—Only the type specimens.

Mysmenopsis furtiva, new species
Figs. 4, 24-42

Types.—Male holotype and one female and two male paratypes collected in *Ischnothele* webs on hillside in dry limestone forest (approximately 300 m

Figures 24-38.—*Mysmenopsis furtiva*: 24-26, holotype male; 24, tibia and metatarsus I, approx. prolateral; 25, 26, palp; 25, retrolateral; 26, ventral; 27-38, females; 27-29, 14 mi E Kingston; 27, 28, femur I, ventral; 29, 30, femur I ventral tubercle, view between ventral and retrolateral; 30, paratype; 31-38, epigyna; 31-33, paratype; 31, cleared, dorsal; 32, ventral; 33, lateral; 34-38, lateral view of five specimens, 14 mi E Kingston. Scale lines: 0.2 for Figs. 25, 26, 28-30; 0.5 for Figs. 24, 27; 0.1 for Fig. 31; 0.25 for Figs. 32-38.

elevation) 14-15 miles east of Kingston, St. Thomas Parish, Jamaica (10 April 1988; F. Coyle, R. Bennett, B. Freeman, and A. Robinson), deposited in the American Museum of Natural History.

Etymology.—The specific name refers to the stealthy, furtive nature by which these kleptoparasites are thought to procure food.

Diagnosis.—To distinguish *M. furtiva* from its close relatives, *M. monticola* and *M. tibialis*, refer to the diagnosis for *M. monticola*.
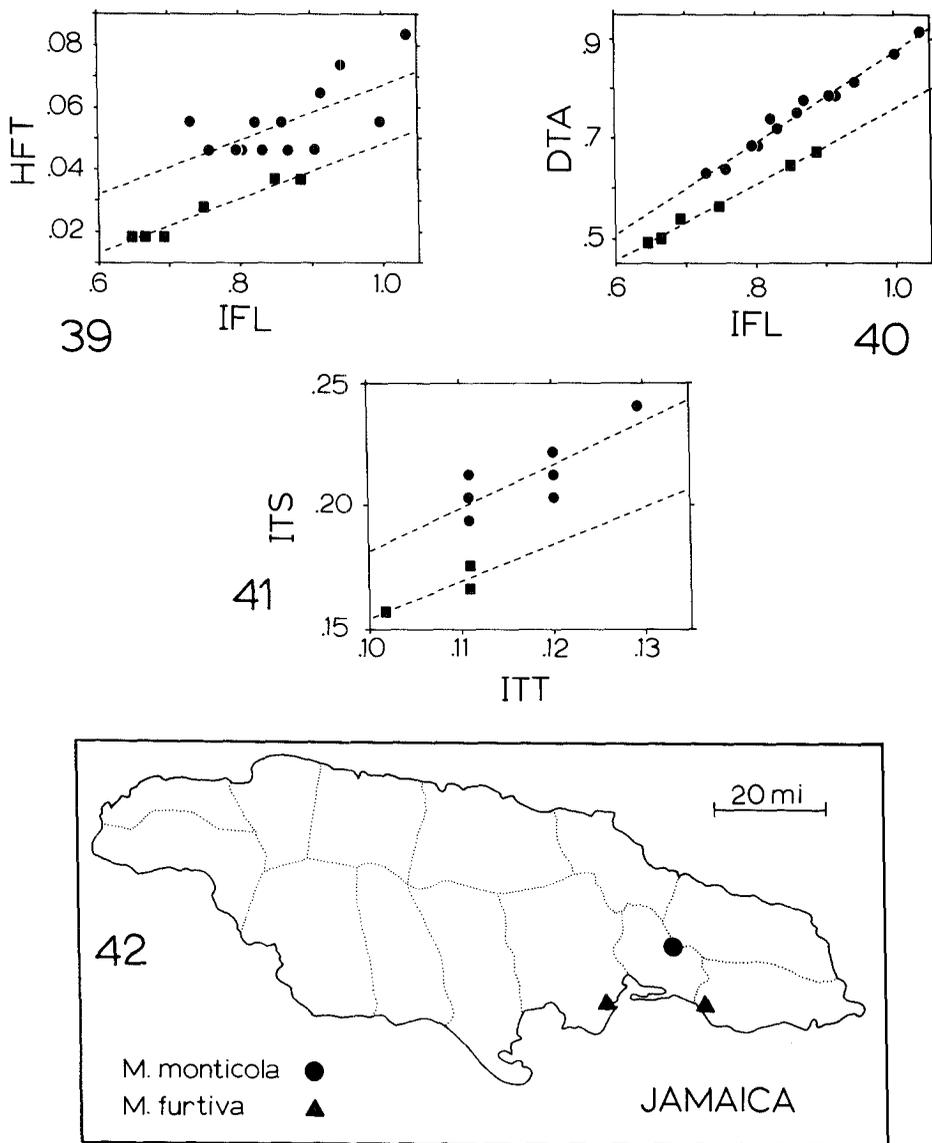
Figures 39-41.—Scattergrams for *Mysmenopsis monticola* (circles) and *M. furtiva* (squares) with regression lines (values in mm); 39, 40 females; 39, HFT vs. IFL (*M. monticola* regression: y = 0.089x − 0.022, r = 0.673; *M. furtiva* regression: y = 0.089x − 0.041, r = 0.979); 40, DTA vs. IFL (*M. monticola* regression: y = 0.923x − 0.047, r = 0.989; *M. furtiva* regression: y = 0.767x − 0.006, r = 0.997); 41, males, ITS vs. ITT (*M. monticola* regression: y = 1.75x + 0.007, r = 0.810; *M. furtiva* regression: y = 1.5x + 0.005, r = 0.866). Fig. 42.—Distribution of Jamaican *Mysmenopsis* species.

Males.—Table 1. Figs. 4, 24-26, 41. Palpal patella with sharp distal keel on retrolateral surface. Palpal tibia with ventral ledge produced into small lobe; no cusps associated with this ledge. Embolus with relatively narrow base; tapers gradually above base; unevenly curved (crooked) in ventral view; ending at distal edge of cymbium. Tibia I clasping spur attached to moderately short tubercle and bent distally. Legs with moderately dark patches on pale tan background; coxae mostly unpigmented; femur I with faint dark patches at proximal end, middle,

and near distal end; rest of femora with darker patches at each end and in middle; patellae with distal dark spot; tibiae with distal dark area and small dark spot in middle; metatarsi with distal dark spot; tarsi unpigmented. Overall, leg I lighter than other legs. Carapace and sternum moderately dark grey-brown. Abdomen with many areas of dark grey or black separated by areas of light grey with white spots; dorsally, two prominent, longitudinal, winding, light grey bands separated by dark central area except for two pairs of narrow median lobes of light grey which come moderately close to connecting at median line.

Females.—Table 2. Figs. 27-40. Distal half of femur I with small yet prominent ventral tubercle with steeply sloping proximal and distal faces, and angular apex; small, rough-surfaced tubercle on retrolateral surface at distal end of femur. Tibia I cylindrical. Metatarsus I without spines. Epigynum at end of long, narrow, unsclerotized, pleated lobe; tip with gentle distoventral slope and blunt, keel-like distodorsal prominence; hairs extend only slightly beyond tip; spermathecae consist of pair of oval chambers with a curved posterior median lobe on each side, and U-shaped, weakly sclerotized lip bordering opening on ventral surface of epigynum. Pigmentation similar to that of males.

Variation.—See the discussion of variation in *M. monticola* regarding the especially wide range of EPL variation in *M. furtiva*. Variation in epigynum shape and femur I tubercle shape is illustrated by Figs. 33-38 and 28-30.

Natural history.—The *M. furtiva* populations were found in much drier habitats than that occupied by *M. monticola* and its host. The Fort Clarence—Hellshire Hills population lived in a hot, dry, cactus thorn scrub community on limestone substrate with little soil. *Ischnothele* host webs at this site were usually found at the bases of rocks where leaf litter accumulates under the scattered small trees, and they were similar in size and shape to those occupied by *M. monticola*. The other *M. furtiva* population inhabited a dry forest community on a rocky (limestone) hillside. Here the host webs were most often found at the bases of rocks and exposed roots, their retreats penetrated the loose limestone pebble substrate, and they were much more abundant than in the cactus thorn scrub. At both sites individuals of *M. furtiva* were observed in several webs, always in the capture web near the retreat mouth. One female was observed carrying an egg sac.

Distribution.—Known from two localities along the south coast of eastern Jamaica (Fig. 42).

Material examined.—The type specimens and the following: **JAMAICA:** ST. CATHERINE PARISH; Fort Clarence and Hellshire Hills near Seafort, 10-50 m elevation, cactus thorn scrub, 9 April 1988 (F. Coyle, R. Bennett, B. Freeman, and A. Robinson), 5 females, several juvs. (AMNH).

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