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NOTES ON *MICRATHYRIA*, WITH DESCRIPTIONS OF *M. PSEUDEXIMIA* SP. N., *M. OCCIPITA* SP. N., *M. DUNKLEI* SP. N. AND *M. DIVERGENS* SP. N. (ANISOPTERA: LIBELLULIDAE)

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The 4 new spp. are described and illustrated for both sexes. *M. kleerekoperi* Calvert, 1946 is discussed and illustrated from a paratype. One of the paralectotype males of the true *M. eximia* Kirby, 1897 is illustrated and the first specimens known since it was described are listed.

INTRODUCTION

In 1975 I visited the British Museum and examined Kirby's types of *Micrathyria eximia* and found them to be very different from what many authors were calling *eximia*. A study of this taxonomic problem turned up four new species which are described herein.

The most often misidentified species with a wide distribution is named *M. pseudeximia* sp. n. I also studied from Ecuador many specimens of *M. occipita* sp. n. A few specimens from Brazil are described as *M. dunklei* sp. n. A paratype of *M. kleerekoperi* Calvert, 1946 found in Calvert's collection at the Academy of Natural Sciences in Philadelphia is illustrated and compared with 16 males and one female from Minas Gerais, Brazil, named *M. divergens* sp. n.

In the collecting data for these species names of some collectors are abbreviated as follows: W.H.D. (W.H. Ditzler), S.W.D. (S.W. Dunkle), A.B.M.M. (A.B.M. Machado), J.W.S. (J.W. Strohm), J.H.W. (J.H. Williamson). In the descriptions of wing characters the notation follows the Comstock-Needham system.

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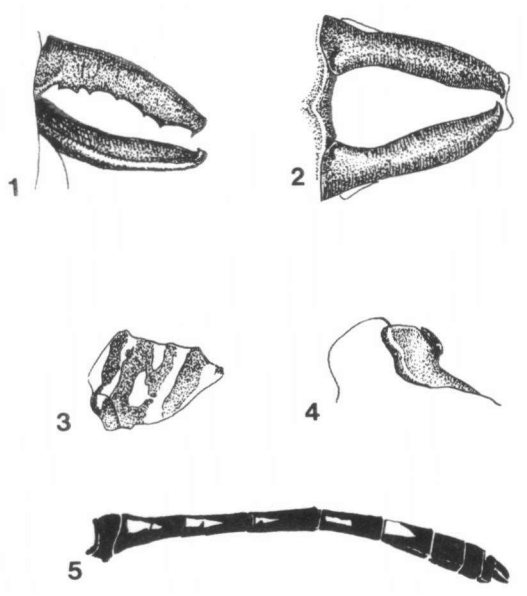
MICRATHYRIA EXIMIA Kirby, 1897

Figures 1-5

Material. – BRAZIL: State of Matto Grosso, Abuná, 14 ♂, 10-24-III-1922; – Villa Murtino, 3 ♂, 27-III and 3-IV-1922; – State of Rondonia (formerly part of Amazonas), 1 ♂, 5-V-1922; all collected J.H.W. and J.W.S. One ♂ of Kirby's syntypes.

The figures show that this species in the male appendages (Figs 1-2) is very different from all other species. Kirby's description is adequate and there would have been no problem if he had given illustrations such as ours. The female remains unknown.



Figs 1-5. *Micrathyria eximia* Kirby, male: (1) lateral view of terminal abdominal appendages; – (2) same in dorsal view; – (3) thoracic color pattern; – (4) lateral view of left hamule and genital lobe of abdominal segment 2; – (5) lateral view of abdomen.

MICRATHYRIA PSEUDEXIMIA SPEC. NOV.

Figures 6-16

Material. – **Holotype** ♂ (No. 944): TRINIDAD: St. Andrew County, small stream at Bridge B1-7 E of Tururе River on Valencia Road, 29-IV-1988, S.W.D. – **Allotype** ♀ (No. 945) taken in wheel with holotype. – **Paratypes** (394 ♂, 29 ♀, and 7 pairs in tandem, ("in copula," or in wheel): TRINIDAD, 80 ♂, 8 ♀ (Jan., Mar., Apr., May, June, July, Aug.); – COSTA RICA, 19 ♂, 1 ♀, 1 tandem pair (Mar., July, Aug., Sept., Oct., Nov.); – GUATEMALA, 7 ♂, 2 ♀, 1 tandem pair (May, Aug.); – HONDURAS, 6 ♂ (Mar.); – PANAMA, 33 ♂, 3 ♀ (Apr., May, July, Aug., Sept., Dec.); – BOLIVIA, 3 ♂ (Sept.); – BRAZIL, 43 ♂, 1 pair in wheel (Feb., Mar., Nov., Dec.); – COLOMBIA, 20 ♂, 1 ♀ (Jan., Feb.); – ECUADOR, 47 ♂, 3 ♀, 1 tandem pair (Mar., July, Aug., Sept., Oct.); – FRENCH GUIANA, 18 ♂ (Feb.); – PARAGUAY, 5 ♂, 1 tandem pair (Aug., Nov.); – PERU, 20 ♂, 2 ♀ (Jan., July, Aug., Sept.); – SURINAM, 12 ♂, 7 ♀, 2 pairs "in copula" (Feb., May, Aug., Dec.); – VENEZUELA, 81 ♂, 2 ♀ (Jan., Feb., Mar., Apr., July).

After the types were designated I received from the National Museum in Rio de Janeiro, Brazil, 15 ♂ and 1 ♀ from various places in Rio de Janeiro state and one identified as *M. kleerekoperi* ?, but all were *pseudeximia*.

Etymology. – The name means "false *eximia*", because this species has for so long been

identified as *eximia* Kirby.

MALE **(holotype).** – H e a d. – Vertex and middle of frons at base metallic blue, this blue area deeply concave on front margin; remainder of frons yellow in middle with sides somewhat greenish yellow as are postclypeus and anteclypeus; labrum and labium yellow; occiput reddish-brown, about ¼ longer than eyeseam and rounded on posterior margin which bears long hairs; rear of head black with bulging posterior part of occiput and a small spot on each postgena lighter; compound eyes metallic green in life.

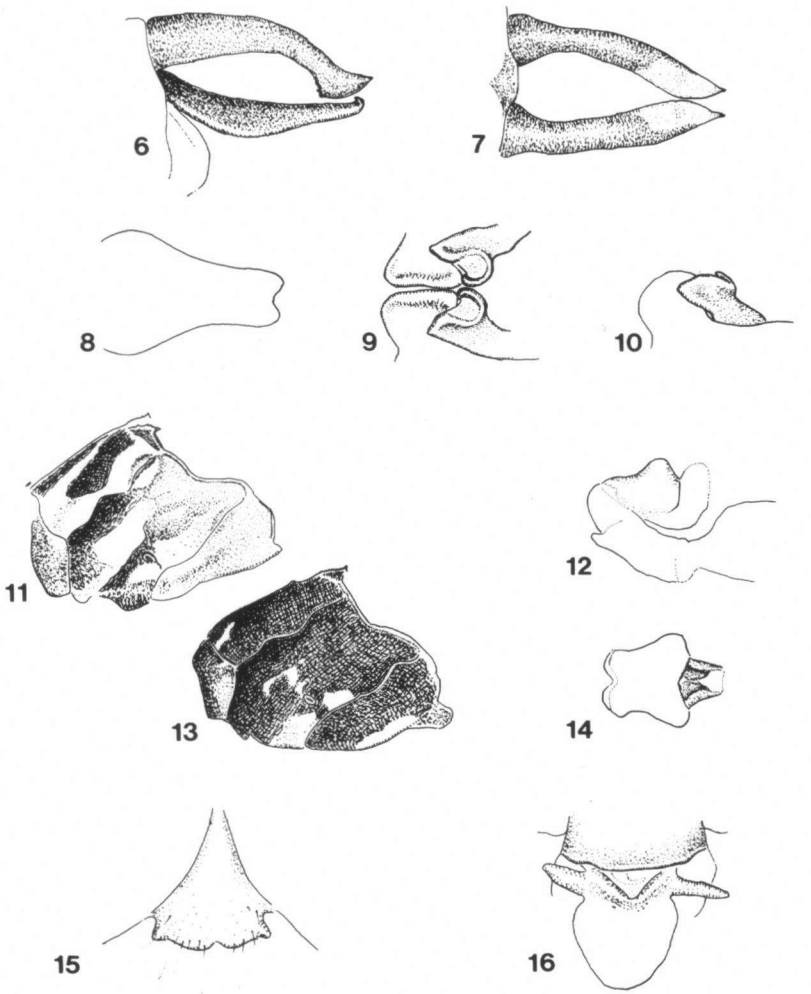
P r o t h o r a x. – Anterior lobe brown at base, with distal half yellow; much raised middle lobe light tan; hind lobe brown, upright, slightly narrowed at base and bearing a fringe of long hairs on hind margin.

S y n t h o r a x. – Dark brown to black with greenish yellow markings as follows: stripe separated from middorsal carina on anterior ⅔ of mesepisternum (Fig. 11), pointed posteriorly and broadly connected anteriorly with a wide wavy stripe bordering the humeral suture and spreading over the mesepisternum above and meeting the antealar carina; a large rectangular area on mesepimeron along the interpleural suture. Metepisternum broadly greenish, with a light stripe on metepimeron bordering metapleural suture. A reddish brown area at pit on humeral suture, and on anterior portion of synthorax around leg bases.

L e g s. – Coxae and trochanters light; proximal ⅔ of ventral surface of 1st femora cream-colored; remainder of legs black.

W i n g s. – Hyaline; forewing with 7½ antenodal crossveins, 6 postnodals; arculus closer to 2nd antenodal, but distinctly proximal to it; triangle and subtriangle free, with inner side of subtriangle bordered by 2 cells and posterior angle separated from hind margin of wing by one row of cells; posttrigonal area (discoidal field) with two rows of cells to wing margin where there are 4 cells; 2 bridge crossveins. Hindwing with 6 antenodal crossveins, 6 postnodals; triangle free; 2 bridge crossveins; between anal angle of triangle and bisector of anal loop only one cell; end part of anal loop not widened so that on A_1 from its separation from Cu_2 to end of anal loop there are only 2 cells, no intercalary cell at heel; anal loop of 10 cells; 1 and 2 rows of cells between anal loop and wing margin; 2 cells reaching from M_4 to Cu_1.

A b d o m e n. – Black, marked with greenish yellow spots or stripes as follows: segment 3 with small spot posterior to transverse carina; 6-8 with narrow broken stripe each side extending about ½ length of segments; 7 with broad stripe each side, not quite joining above and reaching about ⅔ length of segment; cerci in lateral view strongly curved downward and considerably narrowed in about terminal ⅓, ending in a short, thickened and upturned sharp tip (Fig. 6), in dorsal view almost straight on outer margin, slightly concave on inner margin, approximated at tips and separated at base by a distance about equal to width of each cercus, terminal portion yellow (Fig. 7); epiproct about equal in length to cerci, in dorsal view concolorous, in ventral view wide at tip, the width at tip



Figs 6-16. *Micrathyria pseudeximia* sp. n., 6-14 male, 15, 16 female: (6) lateral view of terminal abdominal appendages; – (7) dorsal view of cerci; – (8) ventral view of epiproct; – (9) ventral view of hamules and genital lobes of abdominal segment 2; – (10) lateral view of left hamule and genital lobe; – (11) thoracic color pattern, Trinidad, (13) Colombia; – (12, 14) lateral and ventral views of penis; – (15) occiput; – (16) vulvar lamina. – [Figs 6-11 from holotype, Figs 15, 16 from allotype].

about ½ greatest width (Fig. 8); hamules of segment 2 in ventral view two--branched (Fig. 9), the inner one clearly visible in lateral view (Fig. 10), about same height as genital lobe; penis with 4th segment in ventral view much wider

distally than basally (Figs. 12, 14).

Measurements (mm). – Total length including appendages 25.0, abdomen 19.0, hindwing 20.0.

FEMALE **(allotype)**. – Similar to male but frons and vertex less metallic blue, more brownish; occiput slightly concave in middle of rear margin, with a conspicuous horn on each lateral corner (Fig. 15); light markings of abdomen more extensive, on 2-6 almost forming a continuous broad stripe, on 7 extending to about 7/9 of segment length; vulvar lamina as in Fig. 16.

Measurements (mm). – Total length 24.0, abdomen 14.0, hindwing 18.0.

VARIATION AMONG PARATYPES. – Males from Colombia and Peru usually have the dark colors of thorax (Fig. 13) and abdomen more extensive, in some cases almost eliminating the light stripes on abdominal segments 3-6, but the light stripe on 7 always large and prominent. Total length of males 23-26.5 mm, abdomen 16.5-17.5, hindwing 18.5-20.5. There is some variation in numbers of antenodal and postnodal crossveins as shown by a count of 44 males from Trinidad. In forewings 7½ antenodals, 93.2%, 8½, 6.8%; 5 postnodals, 4.4%, 6, 79.5%, and 7, 16.1%. In hindwings 6 antenodals, 98.9%, and 7, 1.1%; 5 postnodals, 4.5%, 6, 77.3%, and 7, 18.2%.

HABITAT AND ASSOCIATES. – *Micrathyria pseudeximia* is a species of ponds, sloughs, and stream pools in sunny open places. It is sometimes associated with *M. ocellata* Martin, less commonly with *M. aequalis* (Hagen).

MICRATHYRIA OCCIPITA SPEC. NOV.

Figures 17-26

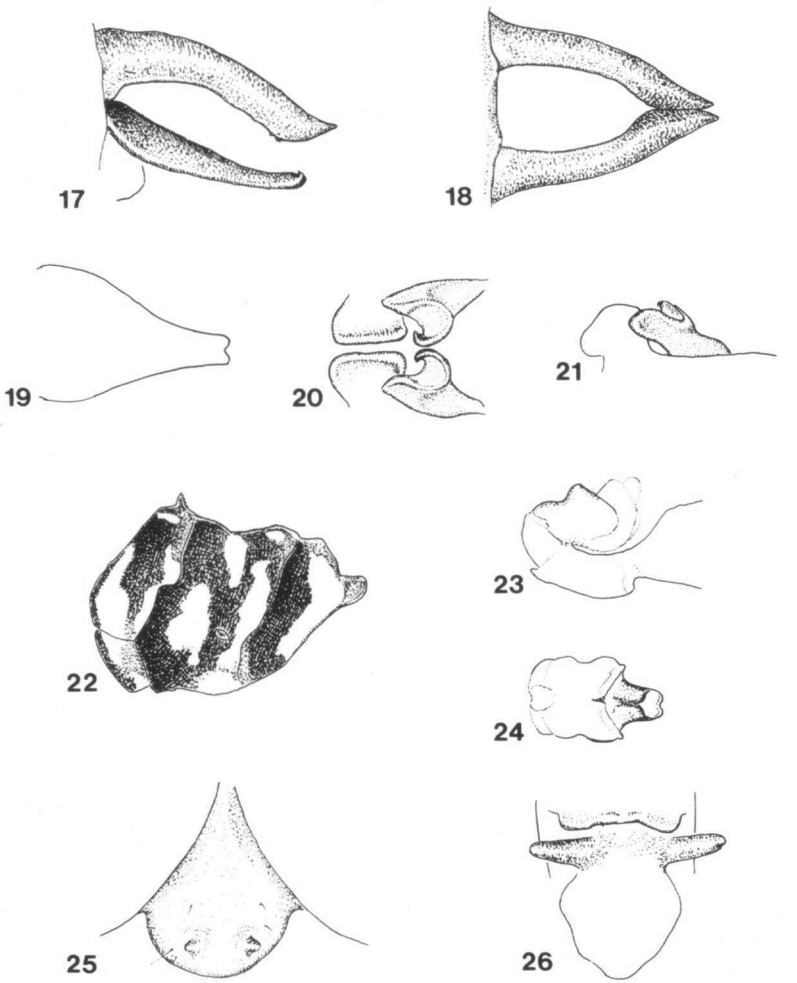
Material. – **Holotype** ♂ (No. 802): ECUADOR, Napo Province, Lake Taracoa near Primavera, 26-VIII-1980, S.W.D. – **Allotype** ♀ (No. 803) taken in tandem with holotype. – **Paratypes** (90 ♂, 5 ♀, and 1 tandem pair): ECUADOR, 90 ♂, 5 ♀, 1 tandem pair (Mar., July, Aug., Sept., Oct., Nov.).

Etymology. – The name was chosen because of the large and distinctive occiput, especially of the female.

MALE **(holotype)**. – Head. – Vertex and middle of upper surface of frons metallic blue, this blue area with a concavity in middle of front border, and extending almost to postclypeus; sides of frons, anteclypeus, postclypeus and labium greenish yellow, labrum bright yellow; occiput shining black, long, its length about 2½ times length of eyeseam and its rear margin almost straight; rear of head black with two bright yellow spots on bulging rear surface of occiput.

Prothorax. – Anterior lobe mostly yellow; much raised middle lobe brown; hind lobe greyish, upright, slightly narrowed at base and bearing a fringe of long, light colored hairs on hind margin.

Synthorax. – Dark brown to black with a metallic sheen, marked with greenish yellow as follows: a broad stripe separated from middorsal carina in



Figs 17-26. *Micrathyria occipita* sp. n., 17-24 male, 25, 26 female: (17) lateral view of terminal abdominal appendages; – (18) dorsal view of cerci; – (19) ventral view of epiproct; – (20) ventral view of hamules and genital lobes of abdominal segment 2; – (21) lateral view of left hamule and genital lobe; – (22) thoracic color pattern; – (23, 24) lateral and ventral views of penis; – (25) occiput; – (26) vulvar lamina. – [Figs 17-22 from holotype, Figs 25-26 from allotype].

about anterior ½ of mesepisternum (Fig. 22), and broadly joined anteriorly with a narrow stripe above the humeral suture for about ⅔ of its length; a small stripe along antealar carina; a large area on mesepimeron adjacent to spiracle, and another smaller area above; metepisternum with a stripe bordering the metapleural

suture for about ¾ its length and a small dorsal spot; metepimeron with broad stripe on its posterior border (Fig. 22).

L e g s. – Coxae and trochanters light; proximal ½ of ventral surface of 1st femora greenish yellow; remainder of legs black.

W i n g s. – Hyaline; forewing with 7½ antenodal crossveins, 7 postnodals; arculus closer to 2nd antenodal, but distinctly proximal to it; triangle and subtriangle free, with inner side of subtriangle bordered by 2 cells, the posterior angle separated from wing margin by one cell row. Posttrigonal area (discoidal field) with 2 rows of cells to wing margin where there are 4 cells; 2 bridge crossveins. Hindwing with 6 antenodal crossveins, 7 postnodals; arculus as in forewing; between anal angle of triangle and bisector of anal loop only one cell; end part of anal loop not widened, so that on A_1 from its separation from Cu_2 to end of anal loop there are only 2 cells, no intercalary cell at heel; anal loop of 10 cells; one cell row and a partial second row between anal loop and wing margin; 2 cells reaching from M_4 to Cu_1.

A b d o m e n. – Black, marked with lighter spots or stripes; segment 2 with large bluish dorsolateral spot each side anterior to transverse carina and almost meeting dorsally in midline; 3 with broad bluish stripe laterally from base to ⅔ length of segment, interrupted by transverse carina; 4-6 with lateral stripe each side from base to about ½ length of segment; 7 with broad stripe each side reaching about ⅔ length of segment; cerci black, in lateral view slightly and evenly curved downward to a sharp, slightly upturned tip, with few small denticles on ventral side just before ventral margin turns dorsally (Fig. 17); cerci in dorsal view convex on outer and inner margins, approximated at tips and separated at base by about width of each cercus (Fig. 18); epiproct in dorsal view with lighter area toward base, equal in length to cerci, and in ventral view narrow at tip, width at tip about ⅕ of greatest width (Fig. 19); hamules of segment 2 in lateral view about same height as genital lobe, two-branched, the outer branch rather wide and almost covering inner branch (Figs 20, 21); penis with 4th segment seen in ventral view about same width distally as basally (Figs 23, 24).

M e a s u r e m e n t s (mm). – Total length including appendages 25.0, abdomen 17.0, hindwing 20.5.

FEMALE **(allotype)**. – Similar to male but metallic blue less extensive on head; upper surface of frons mostly diffuse brownish; occiput shining dark brown, very large and strongly rounded posteriorly, its length about 3 times length of eyeseam, with 2 raised tubercles near posterior margin which is fringed with few short hairs (Fig. 25); proximal ⅔ of ventral surface of 1st femora cream-colored; abdomen with light markings more extensive and more yellowish than blue; segment 2 with large dorsolateral spot anterior to transverse carina and continuous over dorsum with one from other side; smaller dorsal spot posterior to transverse carina not continuous with one from other side; 3-4 with light lateral stripe each side full length of segments, interrupted only by transverse carina; 5-6 with stripe

shorter, about 5/6 and 4/5 as long as segments respectively; 7 with slightly wider stripe for 3/4 length of segment; vulvar lamina as in Figure 26.

Measurements (mm). – Total length 25.0, abdomen 15.0, hindwing 21.0.

HABITAT AND ASSOCIATES. – *Micrathyria occipita* seems to prefer more shaded sites than *M. pseudeximia*, but both species were found together at a brushy pond and a swamp like in Ecuador. At a forest pond in Brazil *M. occipita* was associated with *M. artemis* Ris, but in Ecuador *occipita* was found together with the heliophilic species *M. catentata* Calvert and *M. romani* Sjöstedt.

MICRATHYRIA DUNKLEI SPEC. NOV.

Figures 27-36

Material. – **Holotype** ♂ (No. 1444): BRAZIL, State of Rondonia (formerly Amazonas), Porto Velho, 1-II-1922, J.H.W. & J.W.S. – **Allotype** ♀ (No. 1445) taken with holotype "in cop." – **Paratypes** (7 ♂, 3 ♀): Porto Velho, 1 ♂ (No. 1446) 25-I-1922, – 2 ♂ (Nos 1447-8) 1-II-1922, – 1 ♂ (No. 1449) 3-II-1922, – 1 ♂ (No. 1450) 13-II-1922, – 2 ♂, 1 ♀ (Nos 1451-3) 17-II-1922, – 2 ♀ (Nos 1454-5) 22-II-1922 (all J.H.W. and J.W.S.).

Etymology. – Named for my former student, Dr Sidney W. Dunkle, for his help in many ways and loan of many of the specimens in this paper.

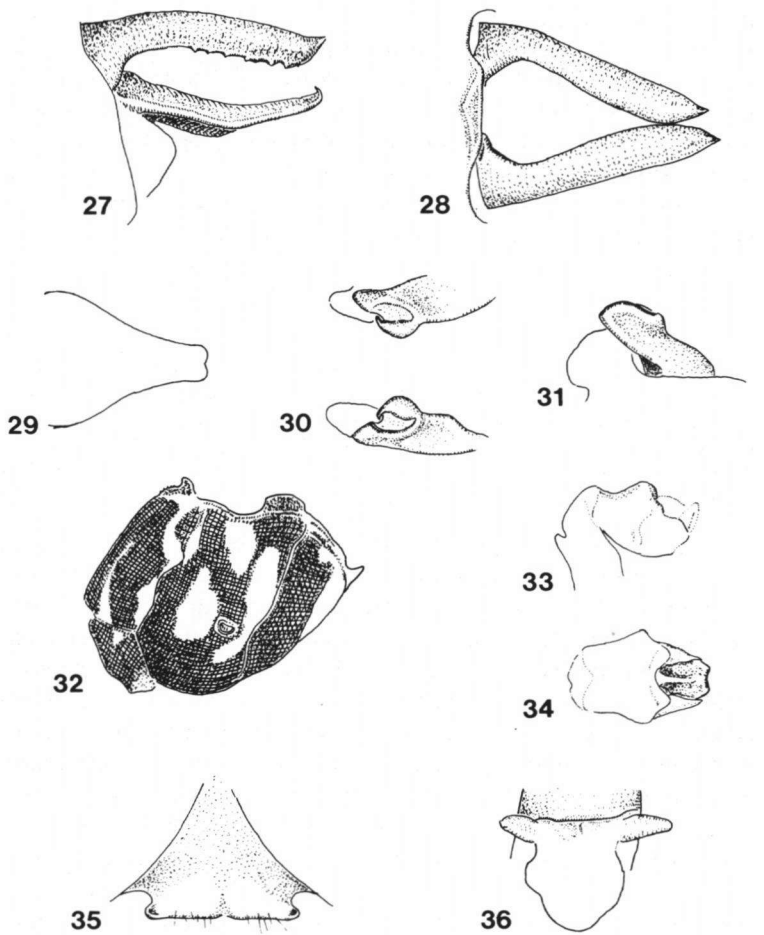
MALE **(holotype).** – Head. – Vertex and middle of upper surface of frons metallic black, reaching almost to anteclypeus, front border concave; sides of frons greenish yellow; remainder of face and labium creamy white, labrum slightly yellowish; occiput shining black, about 1/4 longer than eyeseam, its posterior border almost straight, with light colored tubercles at lateral tips; rear of head black without lighter markings. Eyes said by collector to be translucent green.

Prothorax. – Anterior lobe brown except yellowish front border; much raised middle lobe brown with latero-posterior margin lighter; hind lobe brown, upright, slightly narrowed at base and bearing a fringe of long, light-colored hairs on hind margin.

Synthorax. – Dark brown, the lighter markings almost obscured (one paratype when wetted with alcohol shows faintly the markings illustrated in Figure 32); area at leg bases, posterior part of metepimeron and entire ventral side of synthorax with considerable pruinosity.

Legs. – Coxae and trochanters of mesothoracic and metathoracic legs light brown, those of prothoracic legs light tan to yellow, with about proximal 1/2 of 1st femora with a broad light ventral stripe; remainder of legs dark brown to black.

Wings. – Distinctly flavescent; forewing with 7½ antenodal crossveins and 7 postnodals in left wing, 8 in right wing; arculus at or distal to 2nd antenodal; triangle and subtriangle free, with inner side of subtriangle bordered by 2 cells, the posterior angle separated from wing margin by 2 cell rows. Posttrigonal area (discoidal field) with 2 rows of cells increasing to 3 about 2 cells before wing margin where there are 4 cells; 2 bridge crossveins. Hindwing with 6 antenodal



Figs 27-36. *Micrathyria dunklei* sp. n., 27-34 male, 35, 36 female: (27) lateral view of terminal abdominal appendages; – (28) dorsal view of cerci; – (29) ventral view of epiproct; – (30) ventral view of hamules and genital lobes of abdominal segment 2; – (31) lateral view of left hamule and genital lobe; – (32) thoracic color pattern; – (33, 34) lateral and ventral views of penis; – (35) occiput; – (36) vulvar lamina. – [Figs 27-32 from holotype, Figs 35-36 from allotype].

crossveins in left wing, 7 in right wing, 7 postnodals in right wing, 8 in left wing; arculus as in forewing; between anal angle of triangle and bisector of anal loop only one cell; end part of anal loop not widened, so that on A_1 from its separation from Cu_2 to end of anal loop there are only 2 cells, no intercalary cell at heel; anal loop of 8 cells; one row of cells between anal loop and wing

margin; 2 cells reaching from M_4 to Cu_1.

Abdomen. – Dark brown to black, segments 4 and 5 with small light spot laterally at base, extending only about 1/10 length of segment; 7 with the usual widened light stripe each side extending about 2/3 length of segment; cerci about equal in length to segments 9 + 10, in lateral view slightly and evenly curved downward to a sharp, slightly upturned tip, with few small teeth on ventral side just before ventral margin turns dorsally (Fig. 27); cerci in dorsal view with outer margin slightly convex near base and then straight to the sharp tips, separated at base by about width of one cercus (Fig. 28); epiproct in dorsal view light brown, length about equal to cerci, and in ventral view with width at tip a little more than 1/4 of greatest width (Fig. 29); hamules of segment 2 in lateral view about as high as genital lobe, very wide, two-branched, inner branch not visible laterally but notably swollen (Figs 30, 31); penis with 4th segment in ventral view with distal margin strongly and evenly concave, much wider distally than basally (Figs 33, 34).

Measurements (mm). – Total length including appendages 28.0, abdomen 19.5, hindwing 21.5.

FEMALE **(allotype)**. – Vertex shining, very light brown, darker at base; upper surface of frons mostly light brown with a darker area at base medially; occiput dark brown, about twice length of eyeseam, hind margin almost straight and lighter in color, with a prominent tubercle at each lateral angle (Fig. 35); proximal 2/3 of ventral surface of 1st femora cream-colored; thorax obscure brown as in male, but some lighter markings more evident, especially toward ventral side; abdominal segments dark brown, with venter and ventro-lateral margins light brown, lateral lighter markings much more extensive than in holotype, especially on 3-4 where they are almost full length of segments; vulvar lamina as in Figure 36.

Measurements (mm). – Total length 26.5, abdomen 17.0, hindwing 21.5.

The collectors' note reads "rather scarce around brush near creek in woods". Three males and three females taken in the state of Amazonas, at Moura on the Rio Negro, July 11, 1922 (J.H.W. & J.W.S.) were thought by the collectors to be this species, but I am not sure of this so they are excluded from the type series. They are teneral, the wings are hyaline, and the thoracic pattern is not the same. They merit further study.

VARIATION AMONG PARATYPES. – The series is quite uniform. The hamules in most are not as high compared to the genital lobe as the figure indicates. There is some variation in numbers of antenodal and postnodal crossveins as shown by counts of the seven male paratypes. In forewings 7½ antenodals, 92%, 8½, 8%; 7 postnodals, 20%, 8, 30%, and 9, 50%. In hindwings 6 antenodals, 79%, 7, 21%; 7 postnodals, 14%, 8, 29%, and 9, 57%. Total length of males is 29-31 mm, abdomen 19-20.5, hindwing 21-23.

MICRATHYRIA DIVERGENS SPEC. NOV.

Figures 37-46

Material. – **Holotype** ♂ (No. 1376): BRAZIL, State of Minas Gerais, São João Del Rei, II-1956, Jandico. – **Allotype** ♀ (No. 1377) Vespasiano near Belo Horizonte, X-1952, A.B.M.M. – **Paratypes** (15 ♂): Lagoa Santa, 1 ♂ (No. 1378) III-1964, A.B.M.M., – 2 ♂ (Nos 1379-80) 23-X-1983, N. Santos, et al., Rio Doce State Park, Cel. Fabriciano, – 2 ♂ (Nos 1381-2) IV-1959, A.B.M.M., – 8 ♂ (Nos 1383-91) same data as holotype, – 2 ♂ (one taken in transformation) (Nos 1391-92) same data as allotype.

Etymology. – The name was chosen because the cerci are very divergent at the apexes.

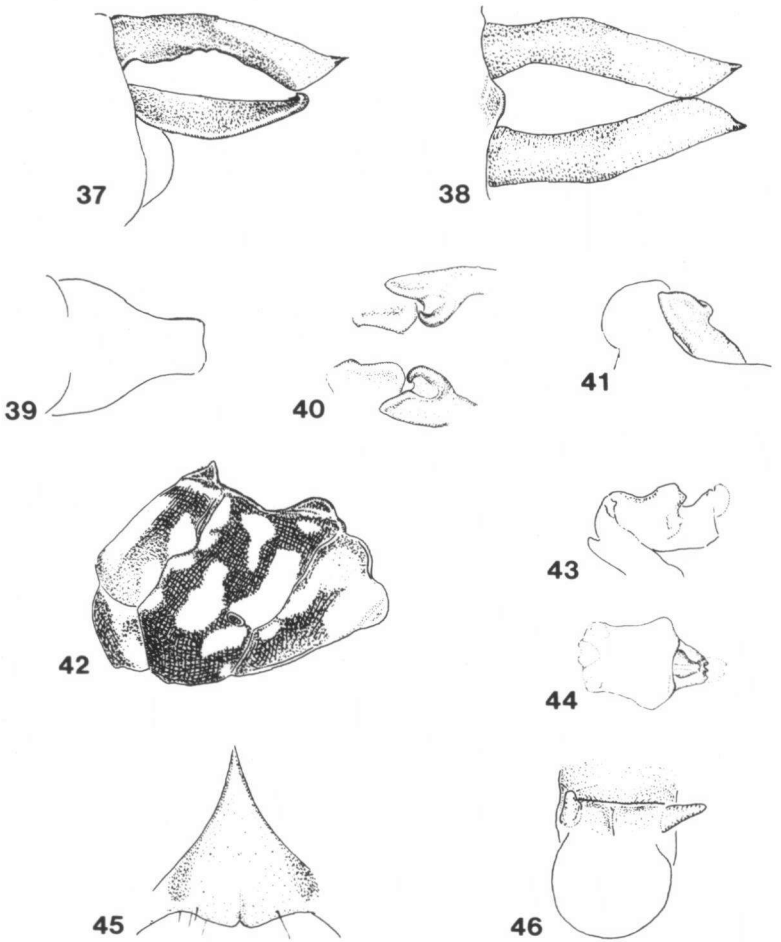
MALE **(holotype).** – Head. – Vertex shining brown, frons with very narrow area adjacent to middle ocellus dark brown or black with metallic blue sheen, remainder of frons, postclypeus and anteclypeus greenish yellow, labrum cream-colored; labium yellow with mesal margins of lateral lobes and median lobe dark brown; occiput shining brown, about equal in length to eyeseam, with a darker raised tubercle about mid-length each side near compound eyes; rear of head dark brown with 3 small light spots each side next to compound eyes; rear of occiput greenish yellow.

Prothorax. – Anterior lobe brown except about anterior ⅓ which is bright yellow; much raised middle lobe brown with 2 adjacent yellow elongated spots, one each side of midline; hind lobe brown, upright, slightly narrowed at base and bearing a fringe of long, light-colored hairs on hind margin.

Synthorax. – Brown to black, marked with extensive greenish yellow as follows: mesepisternal stripe about equal in width to ½ the middorsal dark stripe and extending from anterior margin to about ⅚ length of mesepisternum, separated posteriorly from light stripe along antealar carina, which is continuous with antehumeral stripe; antehumeral becomes very wide anteriorly, spreading across the humeral suture to cover the anterior part of mesepimeron; antehumeral at mid-height joined with broad inverted U-shaped area of mesepimeron posteriorly which reaches the interpleural suture and the antealar carina; mesepisternum with a broad stripe reaching the interpleural suture, almost full length, with a spot at antealar carina, and a smaller one anteriorly next to the metapleural suture; about posterior ⅔ of metepimeron, only anterior ⅓ dark. (There is some variation from this pattern where the light color predominates. Figure 42, drawn from paratype No. 1383, shows less extensive light markings than described here for the holotype).

Legs. – Black, with coxae and trochanters lighter; about proximal ½ of 1st femora greenish yellow.

Wings. – Hyaline; forewing with 7½ antenodal crossveins and 6 postnodals; arculus closer to 2nd antenodal than 1st; triangle and subtriangle free, with inner side of subtriangle bordered by 2 cells, the posterior angle separated from wing margin by one cell row. Posttrigonal area (discoidal field) with 2 rows of cells,



Figs 37-46. *Micrathyria divergens* sp. n., 37-44 male, 45, 46 female: (37) lateral view of terminal abdominal appendages; – (38) dorsal view of cerci; – (39) ventral view of epiproct; – (40) ventral view of hamules and genital lobes of abdominal segment 2; – (41) lateral view of left hamule and genital lobe; – (42) thoracic color pattern; – (43, 44) lateral and ventral views of penis; – (45) occiput; – (46) vulvar lamina. – [Figs 37-44 from paratypes, Figs 45-46 from allotype].

then 3 rows to 2 cells from margin, and 4 cells on margin; 2 bridge crossveins. Hindwing with 6 antenodal crossveins and 6 postnodals on one wing, 7 on the other; arculus very slightly proximal to 2nd antenodal; between anal angle of triangle and bisector of anal loop only one cell; end part of anal loop slightly widened, on A_1 from its separation from Cu_2 to end of anal loop only 2 cells,

no intercalary cell at heel; anal loop of 10 cells; 2 cell rows between anal loop and wing margin; 3 cells reaching from M_4 to Cu_1.

A b d o m e n. – Dark brown to black, marked with greenish yellow as follows: segment 1 with a lateral spot each side; 2 and 3 with a broad lateral stripe full--length, interrupted only by the transverse carina; wide lateral stripes on 4-6, about 8/9 length of segments on 4 and 5, 7/8 on 6, the stripes tapering slightly to rearward, on 7 extending a little more than 3/4 length of segment, a bit wider at base than on 6, tapered to rearward; cerci equal in length to segments 9 + 10, evenly decurved to tip in lateral view, with a ventro-lateral expansion near light brown base, apical 1/2 yellow, with a sharp tip, the ventral side bearing about 7 small denticles in a single row just before ventral margin turns dorsally (Fig. 37); cerci in dorsal view converging from base, then strongly divergent near apexes (Fig. 38); epiproct shorter than cerci, in ventral view about 2/5 as wide at apex as at base (Fig. 39); hamule about equal in height to genital lobe, the inner branch slightly visible in lateral view (Figs 40, 41); penis with 4th segment seen in ventral view much wider distally than basally (Figs 43, 44).

M e a s u r e m e n t s (mm). – Total length including appendages 30.0, abdomen 19.0, hindwing 22.0.

FEMALE **(allotype)**. – H e a d. – Vertex mostly very light tan; upper surface of frons yellowish except around middle ocellus where it is dark brown; postclypeus and anteclypeus slightly greyish yellow, labrum yellow; lateral lobes of labium yellow except medial margins which are slightly brown; occiput light brown, about twice length of eyeseam, slightly and smoothly convex on hind margin, with a small indentation in middle, no horns or tubercles (Fig. 45); back of head black except rear surface of occiput entirely yellow, and yellow markings laterally at eye margins.

P r o t h o r a x. – Anterior lobe brown at base with front margin yellow; much raised middle lobe light brown; hind lobe light tan, upright, slightly narrowed at base and bearing a fringe of long, light-colored hairs on hind margin.

S y n t h o r a x. – Yellow to tan, almost unmarked; a wide yellow stripe on each side of dorsum almost full length, surrounded by brown, especially next to yellow middorsal carina.

L e g s. – Coxae and trochanters light; 1st femora on ventral side white full length; remainder of legs black.

W i n g s. – Hyaline; forewing with 8 1/2 antenodal crossveins in left wing, 7 in right wing, 7 postnodals in left wing, 8 in right; arculus closer to 2nd antenodal crossvein, but distinctly proximal to it; triangle and subtriangle free, with inner side of subtriangle bordered by 2 cells in left wing, 3 in right, separated from wing margin by 2 cell rows; posttrigonal area (discoidal field) with 2 rows of cells, increasing to 3 just beyond subnodus; 2 bridge crossveins. Hindwing with 6 antenodal crossveins, and 6 postnodals; arculus as in forewing; between anal angle of triangle and bisector of anal loop one cell; end part of anal loop scarcely

widened, so that on A_1 from its separation from Cu_2 to end of anal loop there are only 2 cells, no intercalary cell at heel; anal loop of 10 cells; 2 full cell rows and a partial third row between anal loop and wing margin; 2 cells reaching from M_4 to Cu_1.

A b d o m e n. – Dark brown to black, with tan stripes each side of segments 1-8, much wider on basal segments where almost entire side is light; 10 light on dorsum; vulvar lamina as in Figure 46.

In comparing figures 285 and 286 of RIS (1911) with our illustrations it is clear that he used a specimen of *M. divergens* from Minas Gerais for his illustrations and description of *eximia*. His other records are very likely *pseudeximia*. Obviously he never saw Kirby's types of *eximia* in the British Museum even though he referred to them.

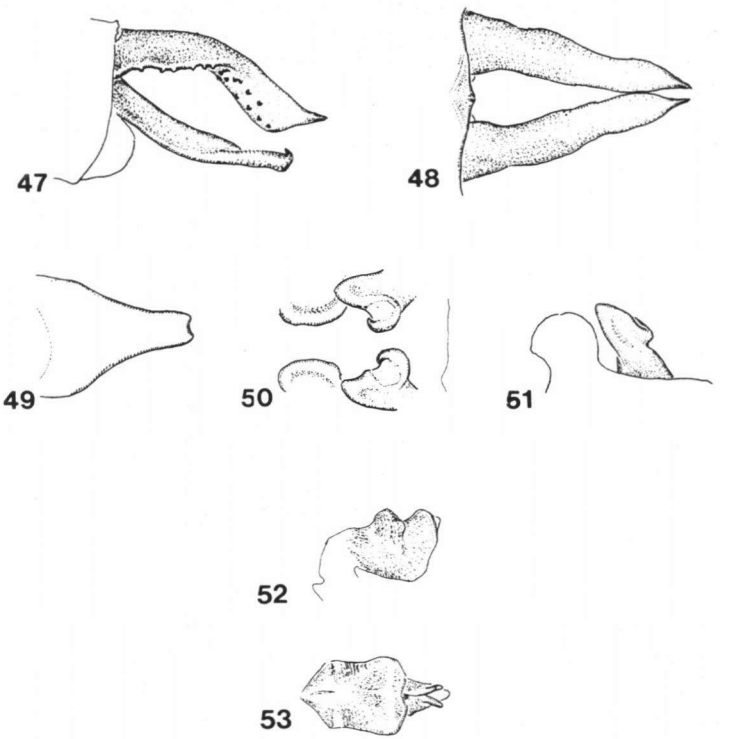
MICRATHYRIA KLEEREKOPERI Calvert, 1946

Figure 47-53

M a t e r i a l. – BRAZIL, State of Sao Paulo, Pirassununga, lakelet, 1 ♂ paratype, January 1941, coll. by H. Kleerekoper.

From Calvert's illustrations and description of this species I earlier thought that the specimens here referred to *M. divergens* were *M. kleerekoperi*, but study of a paratype in the Calvert collection at the Academy of Natural Sciences in Philadelphia changed my mind. It was similar in some respects, but different in so many ways that they have been treated here as two species. They both have the cerci yellow in the apical part. The extent of the lighter markings on the abdomen is greater than in the other species treated in this paper. Some noted differences are shown below.

	M. divergens	*M. kleerekoperi*
(1)	Less dark on frons	More dark on frons
(2)	Cerci obliquely truncate	Not so
(3)	Tips of cerci in dorsal view divergent	Tips of cerci in dorsal view parallel
(4)	Cerci thicker and less arched	Cerci thinner and more arched
(5)	Cerci with one even row of denticles on ventral surface	Cerci with two uneven rows of denticles on ventral surface
(6)	Epiproct broad at tip	Epiproct narrow at tip
(7)	Fewer paranals in forewing	Usually more paranals in forewing
(8)	Two cells on "sole" of foot-shaped anal loop	Three cells on "sole" of foot-shaped anal loop
(9)	Abdomen length 18.5-21.0 mm (males)	Abdomen length 17.0-18.0 mm (from Calvert) (males)
(10)	Hindwing length 20.5-23.5 mm (males)	Hindwing length 20.0-21.5 mm (from Calvert) (males)



Figs 47-53. *Micrathyria kleerekoperi* Calvert, male: (47) lateral view of terminal abdominal appendages; – (48) dorsal view of cerci; – (49) ventral view of epiproct; – (50) ventral view of hamules and genital lobes of abdominal segment 2; – (51) lateral view of left hamule and genital lobe; – (52, 53) lateral and ventral views of penis. – [From paratype male].

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