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Cretaceous Diptera From Orapa, Botswana.

Waters, Saskia

1990
https://hdl.handle.net/10539/26454

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FIGURE 46

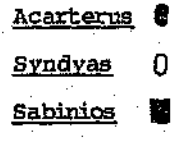
Family HYBOTIDAE

Subfamily HYBOTINAE

Distribution in southern Africa of the genera:

Acarterus, Syndyas and Sabinios

(after Smith, 1969).



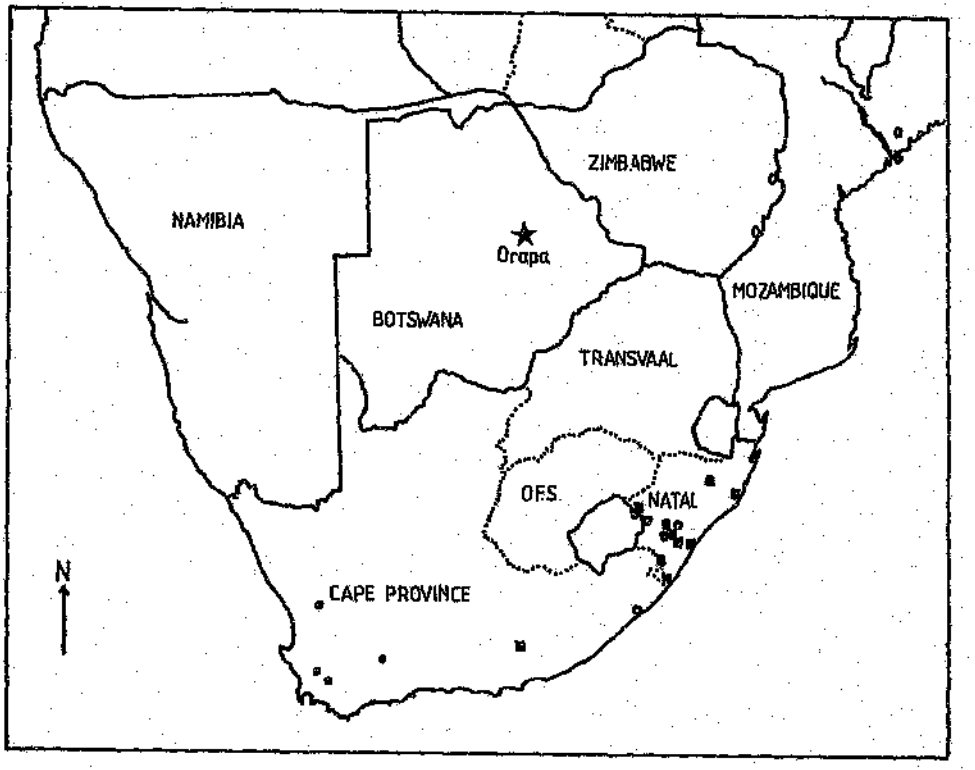

ZIMBABWE
NAMIBIA
Orapa
MOZAMBIQUE
BOTSWANA
TRANSVAAL
OFS.
NATAL
N
CAPE PROVINCE

FIGURE 46

FIGURE 47

Family ?MYCETOPHILIDAE

SPECIMEN 1: (BP/2/22455), whole specimen (x47.5).

Inset: chaetotaxy of fore legs (x58.0).

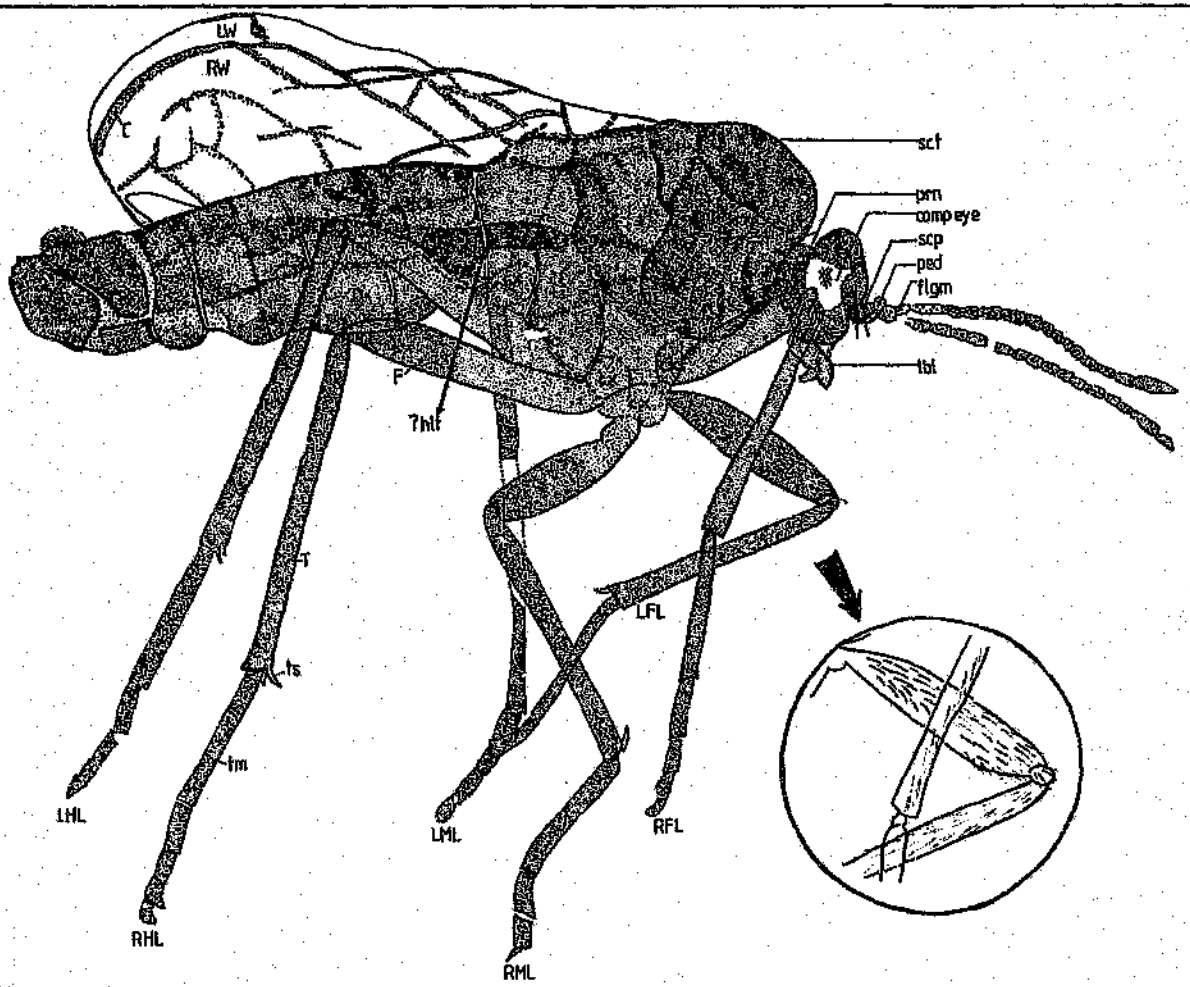

LW
RW
scl
pm
compeye
scp
ped
flgm
tbl
thlf
LFL
RFL
LML
RML
LHL
RHL
fm
ts

FIGURE 47

FIGURE 48

Family ?RHAGIONIDAE

SPECIMEN 2: (BP/2/25896), wing (x73.2).

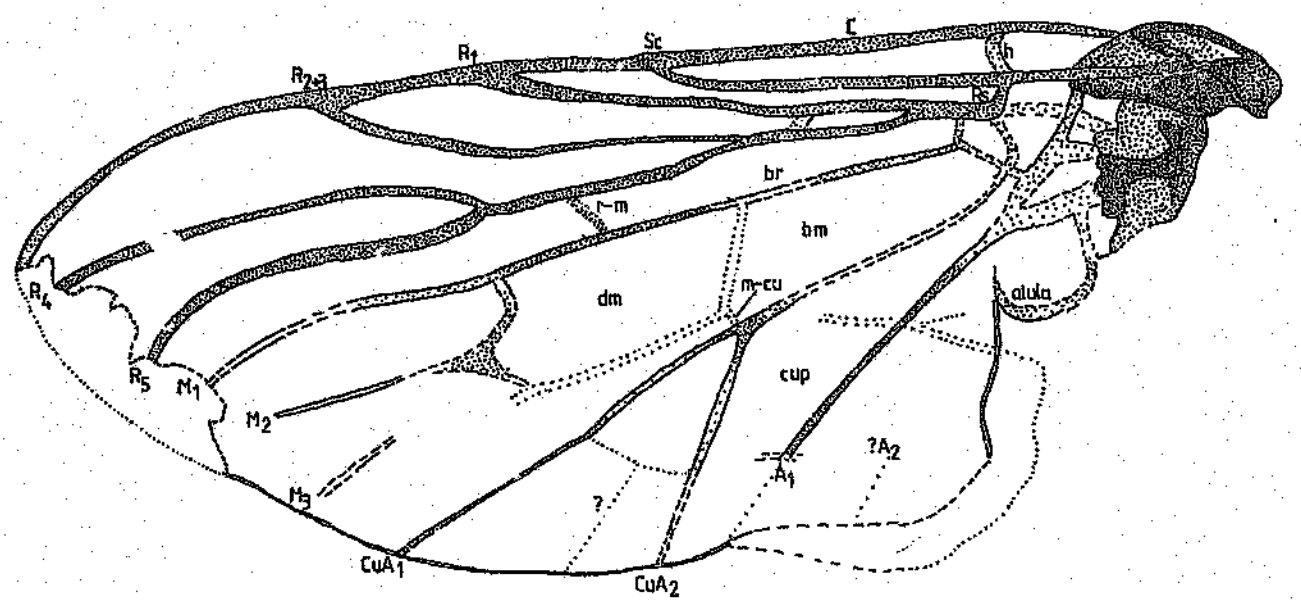

C
Sc
R1
R2+3
h
br
r-m
bm
dm
m-cu
R4
R5
M1
M2
M3
cup
alula
?A2
A1
?
CuA1
CuA2

FIGURE 48

FIGURE 49

Family ?RHAGIONIDAE/

?TABANIDAE

SPECIMEN 3: (BP/2/18217), whole specimen (21.8).

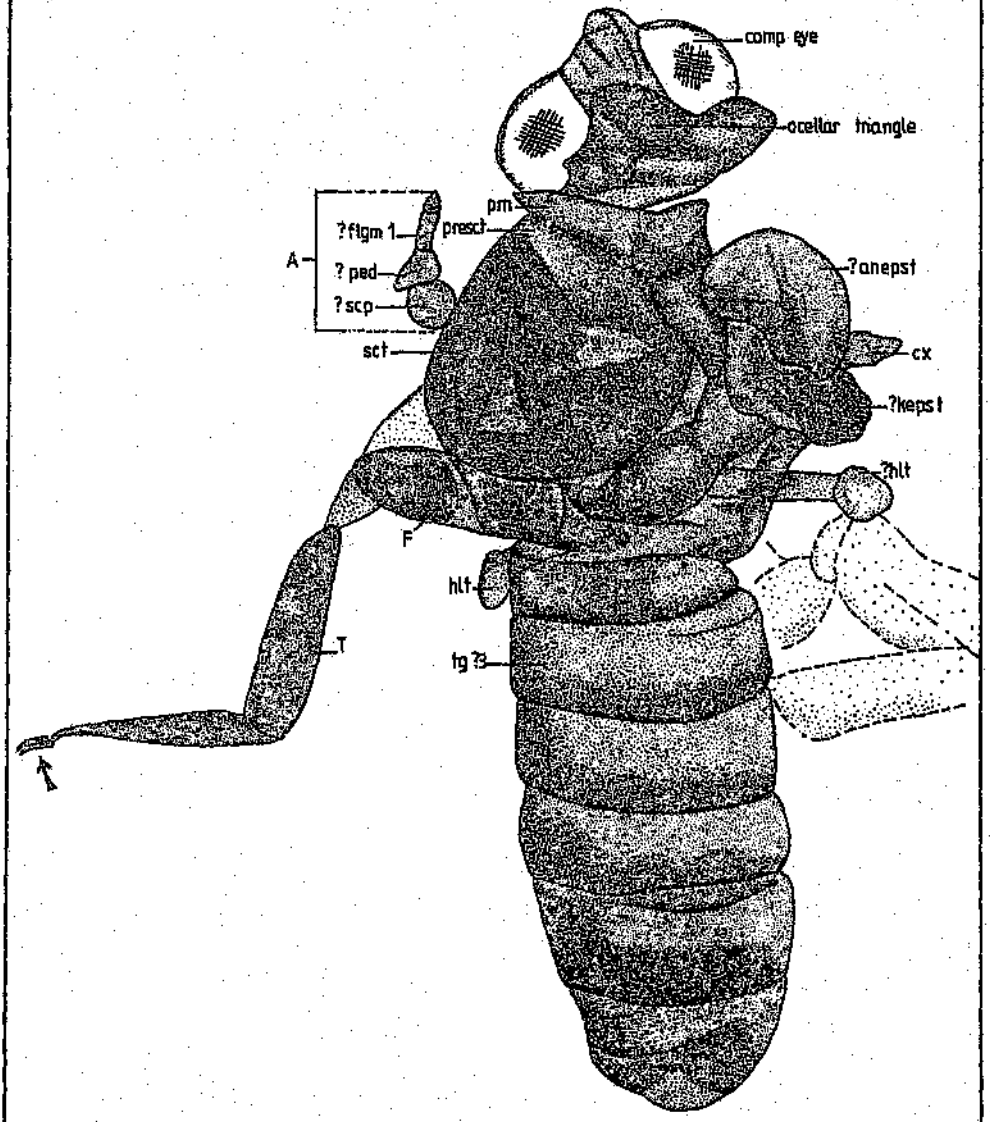

comp. eye
ocellar triangle
pm
?figm 1
presct
A
? ped
? scp
sct
?anepst
cx
?kepst
?hlt
F
hlt
T
tg ?3

FIGURE 49

FIGURE 50

Family ?Mycetophilidae

SPECIMEN 1: (BP/2/26238), whole specimen (x50.3).

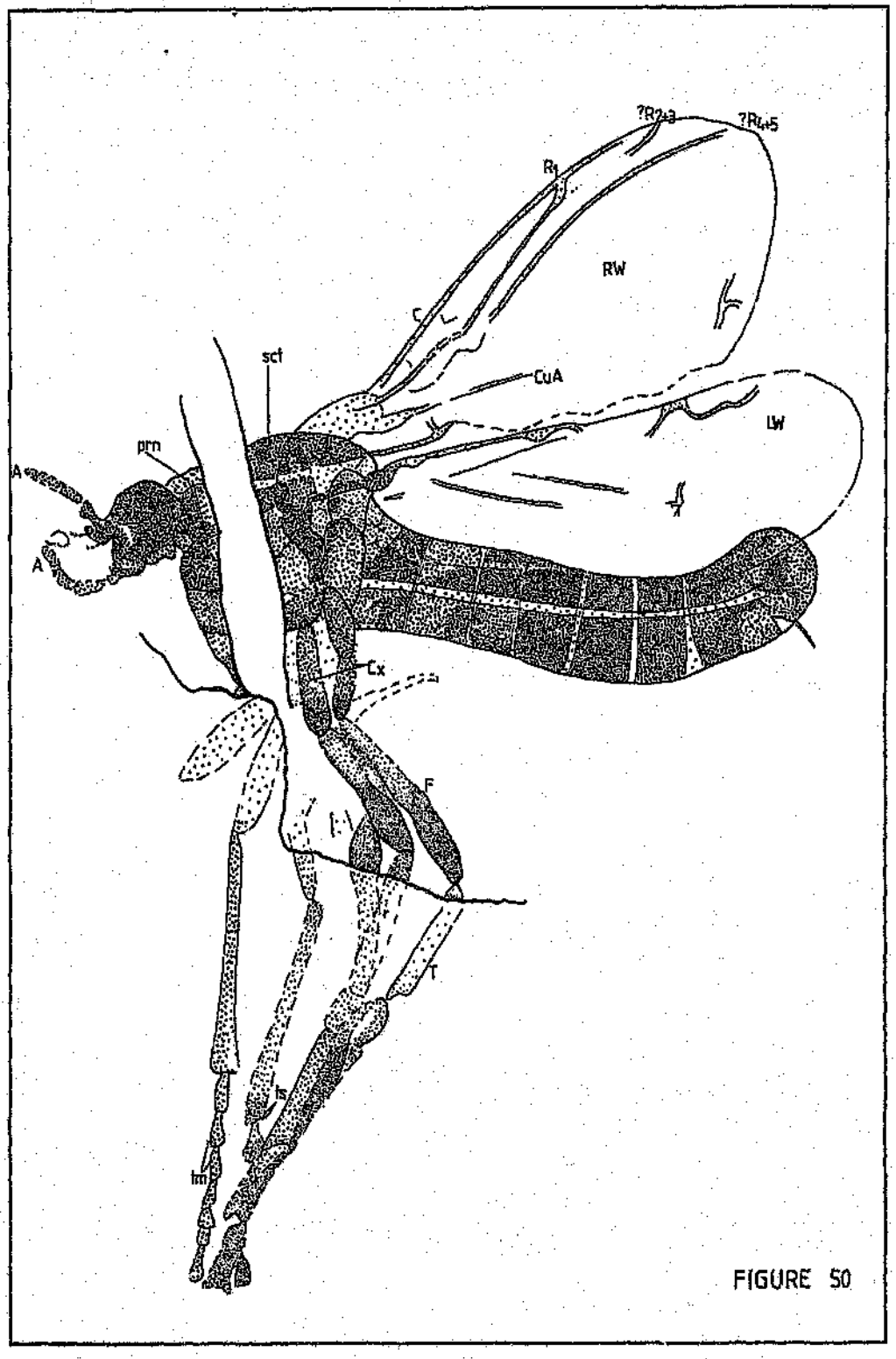


FIGURE 50

FIGURE 51

Family ?

SPECIMEN 2: (BP/2/fragment), whole specimen (x54.8).

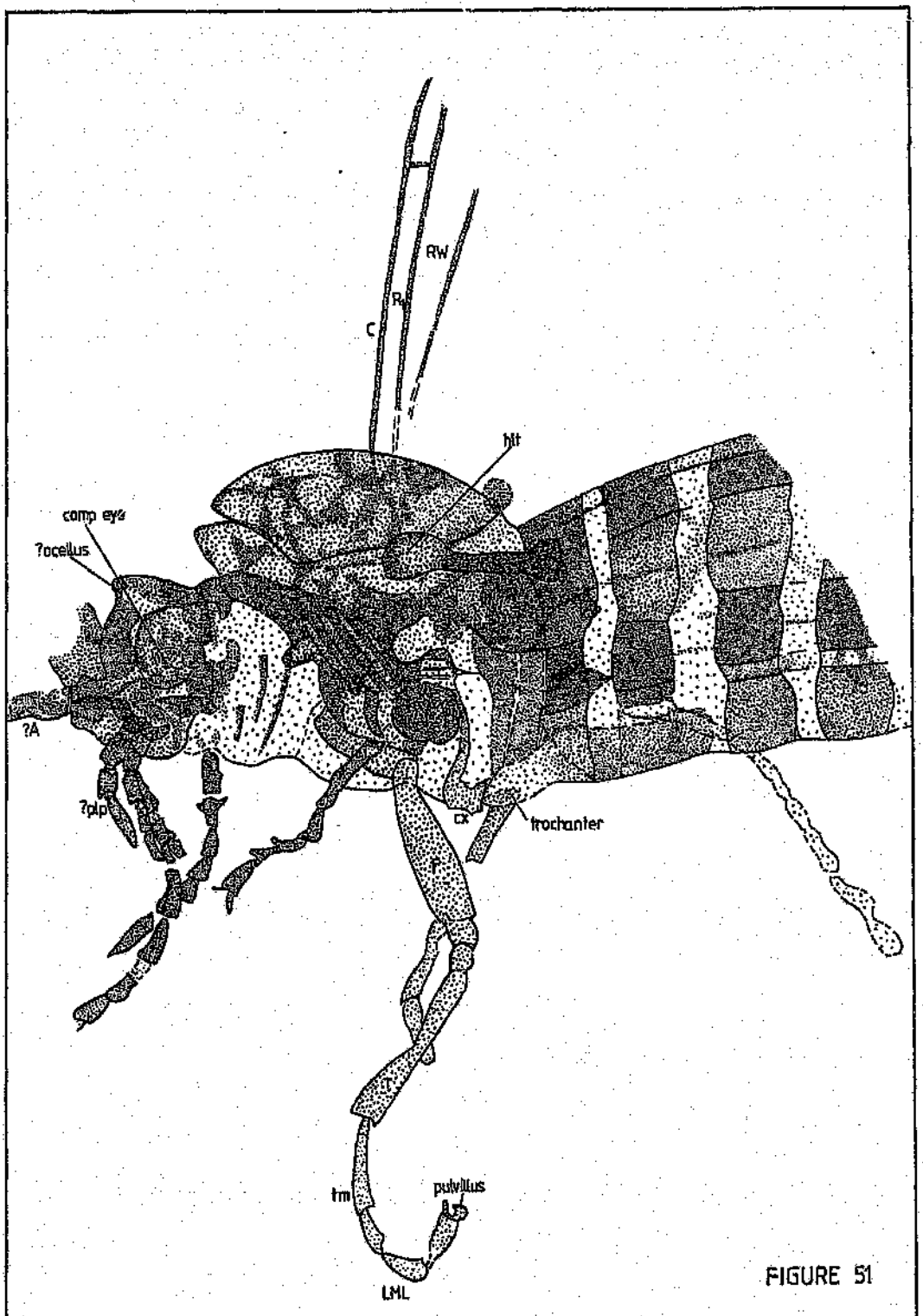

RW
R
C
hlt
comp eye
?ocellus
?A
?plp
cx
trochanter
F
T
tm
pulvillus
LML

FIGURE 51

FIGURE 52

Family ?

SPECIMEN 3: (BP/2/25974), whole specimen (x38.1).

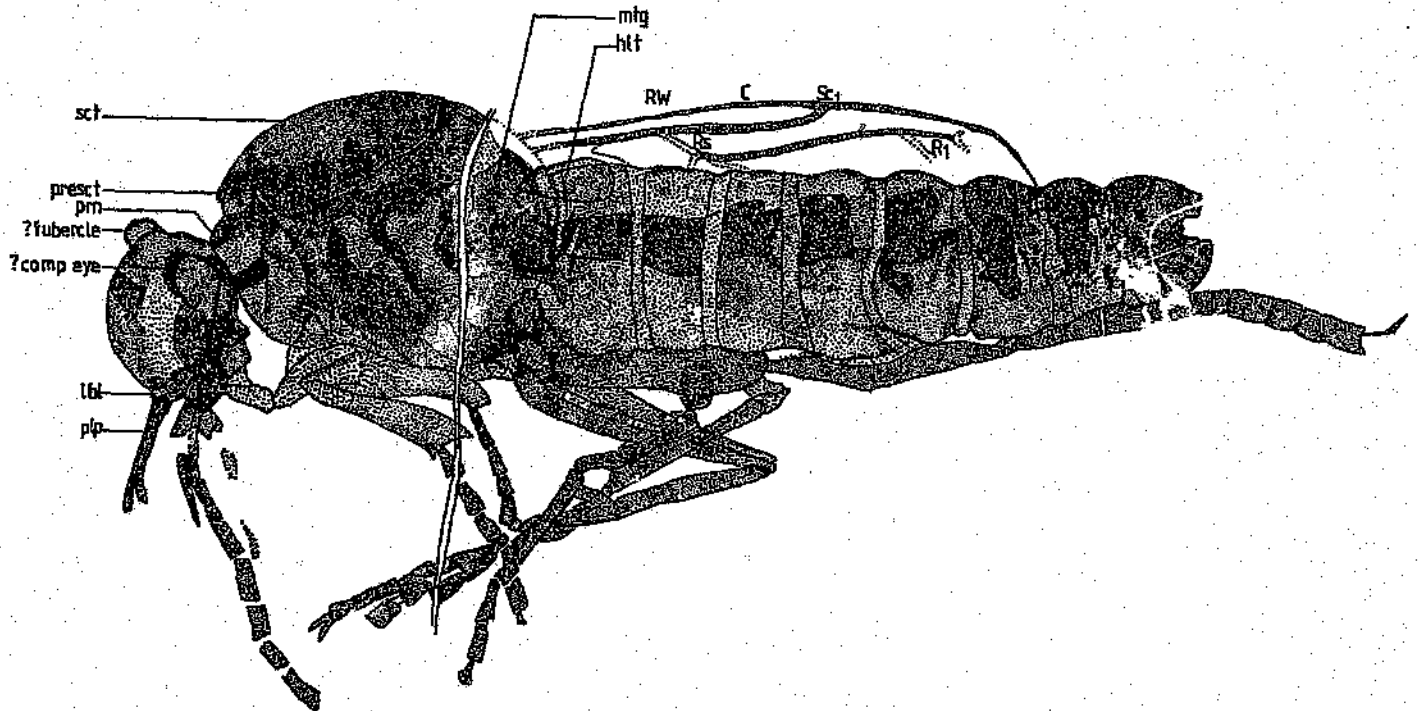


FIGURE 52

FIGURE 53

Family ?Anisopodidae

SPECIMEN 4: (BP/2/26852), whole specimen (x69.5).

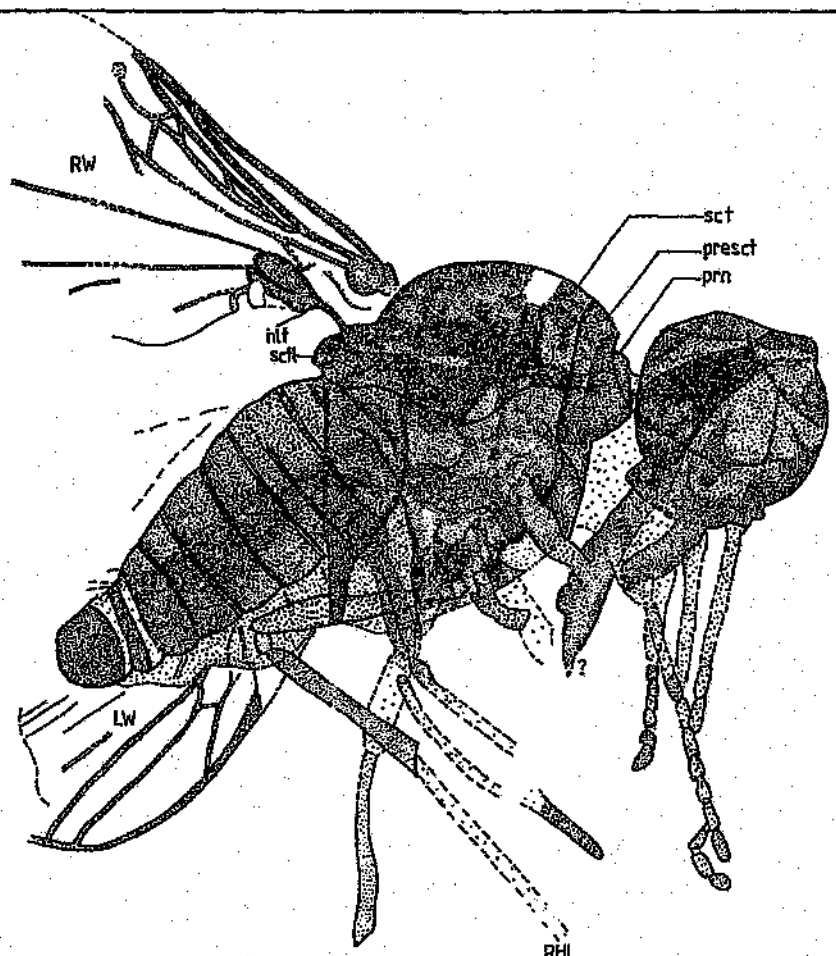


FIGURE 53

FIGURE 54

SPECIMEN 4: (BP/2/26852), reconstruction of wing (x69.5): A–D represent various ways in which the left and right wings (i.e. distal and proximal parts respectively) may be joined. Note the differences that may be possible in wing length and venation.

FIGURE 54

FIGURE 55

Protolbiogaster rhaetica Rohdendorf

(Family Protolbiogastridae)

(according to Rohdendorf, 1974).

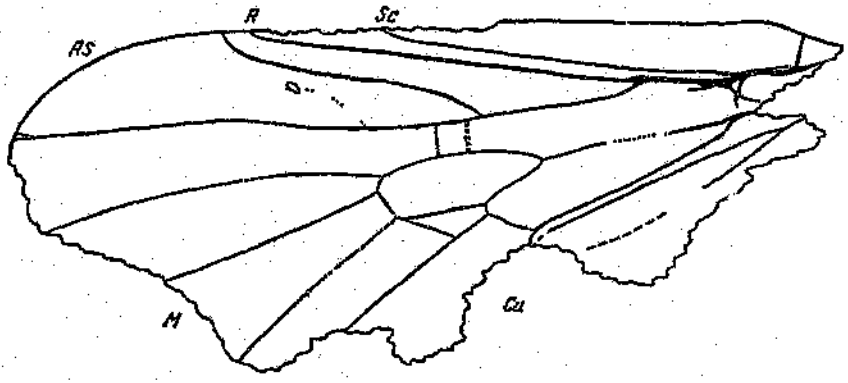


FIGURE 55

FIGURE 56

Family ?

SPECIMEN 5: (BP/2/25248), whole specimen (x27.2).

FIGURE 56

FIGURE 57

Family ?

SPECIMEN 5: (BP/2/25248) (x27.2).

(a) Left wing.

(b) Right wing.

(c) composite of left and right wings.

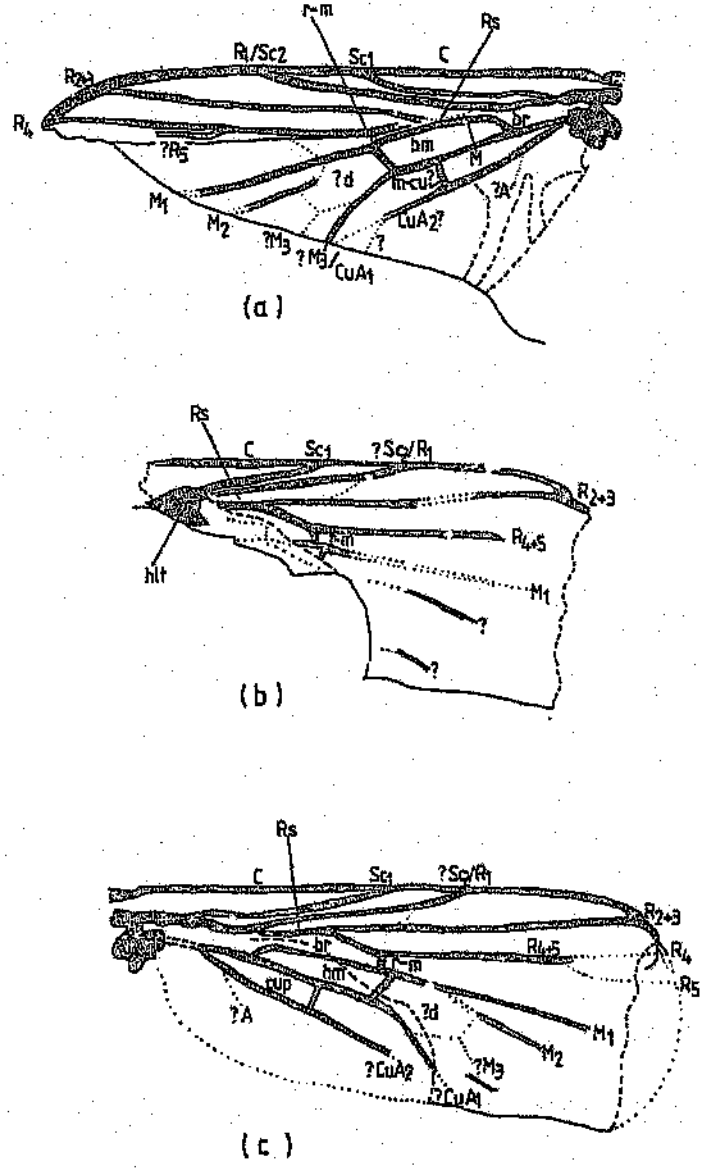

r-m
Rs
R1/Sc2
Sc1
C
R2+3
R4
?R5
br
bm
?d
M
m-cu
?A
M1
M2
?M3
?M4
CuA2?
?
CuA1
(a)
Rs
C
Sc1
?Sc/R1
R2+3
R4+5
r-m
hlt
M1
?
?
(b)
Rs
C
Sc1
?Sc/R1
R2+3
R4+5
R4
R5
br
bm
m
cup
?A
?d
M1
M2
?M3
?CuA2
?CuA1
(c)

FIGURE 57

FIGURE 58

Family ?

SPECIMEN 6: (BP/2/25911), whole specimen (x66.0).

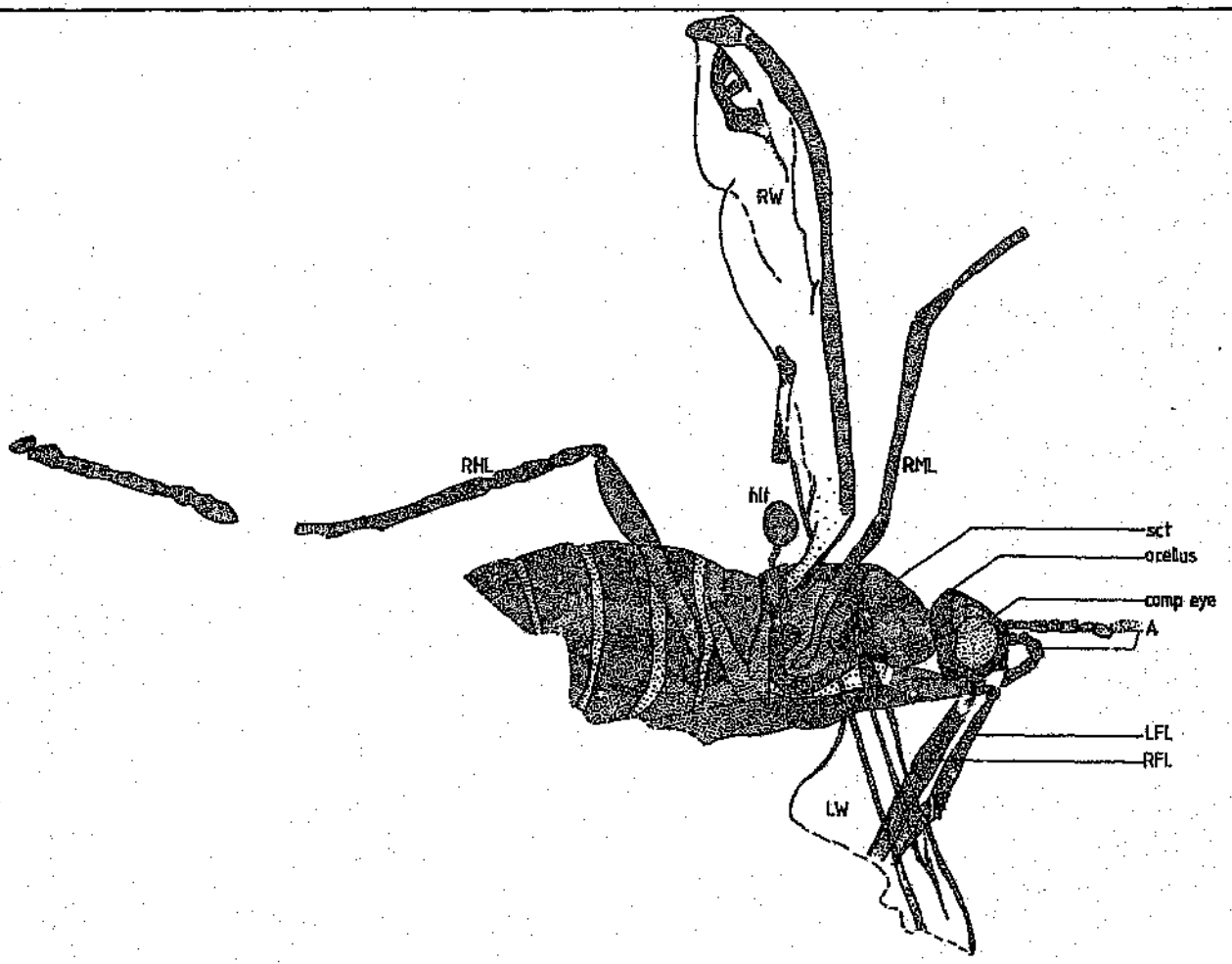


FIGURE 58

FIGURE 59

Family ?

SPECIMEN 7: (BP/2/25859), whole specimen (x54.8).

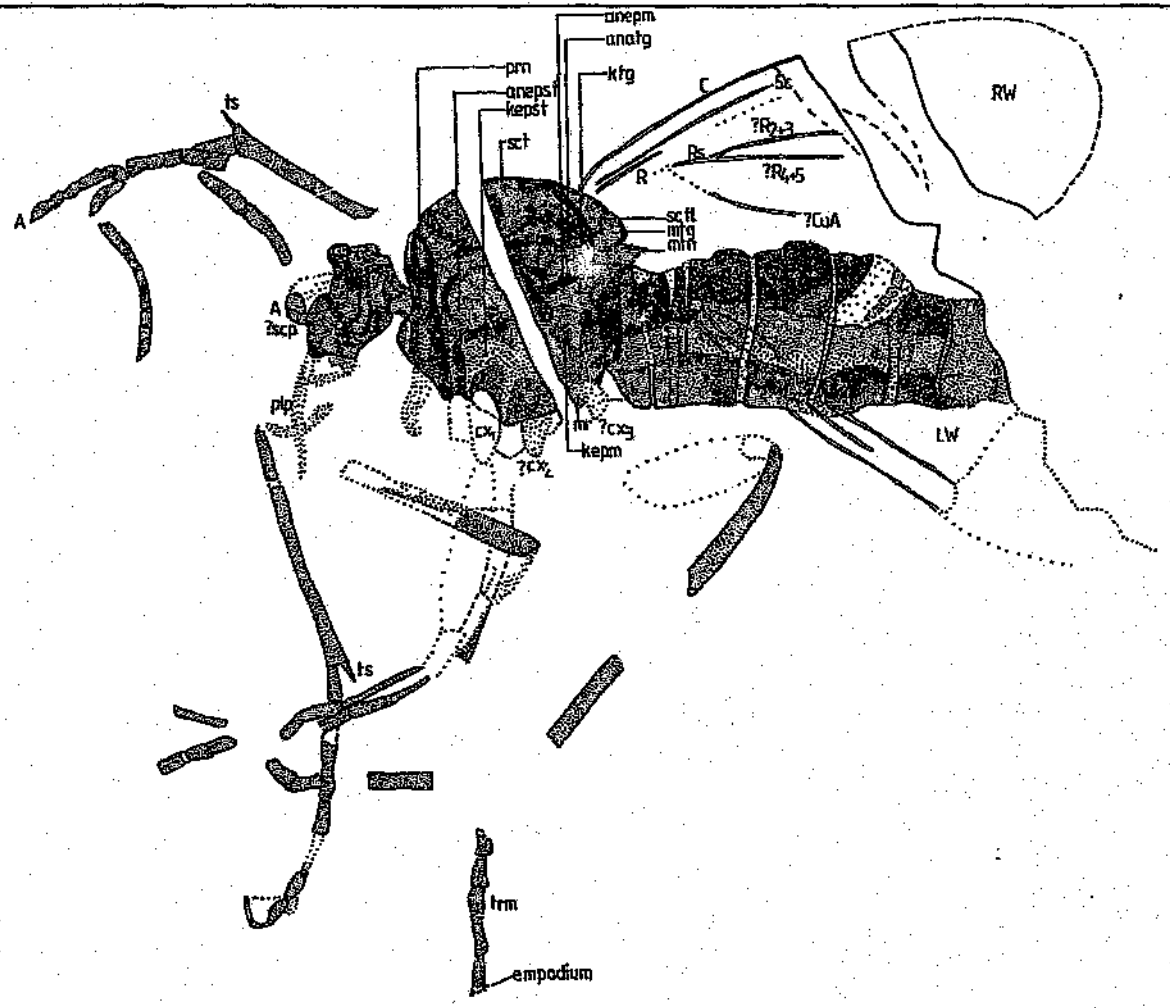

anepm
anatg
prn
anepst
kfg
kepst
sct
ts
A
?scp
plp
cx1
?cx2
?cxg
kepm
C
Sc
?R2+3
Rs
R
?R4+5
?CuA
scft
mfg
mfn
RW
LW
ts
trm
empodium

FIGURE 59

FIGURE 60

Family ?

SPECIMEN 8: (BP/2/22455), whole specimen (x36.1).

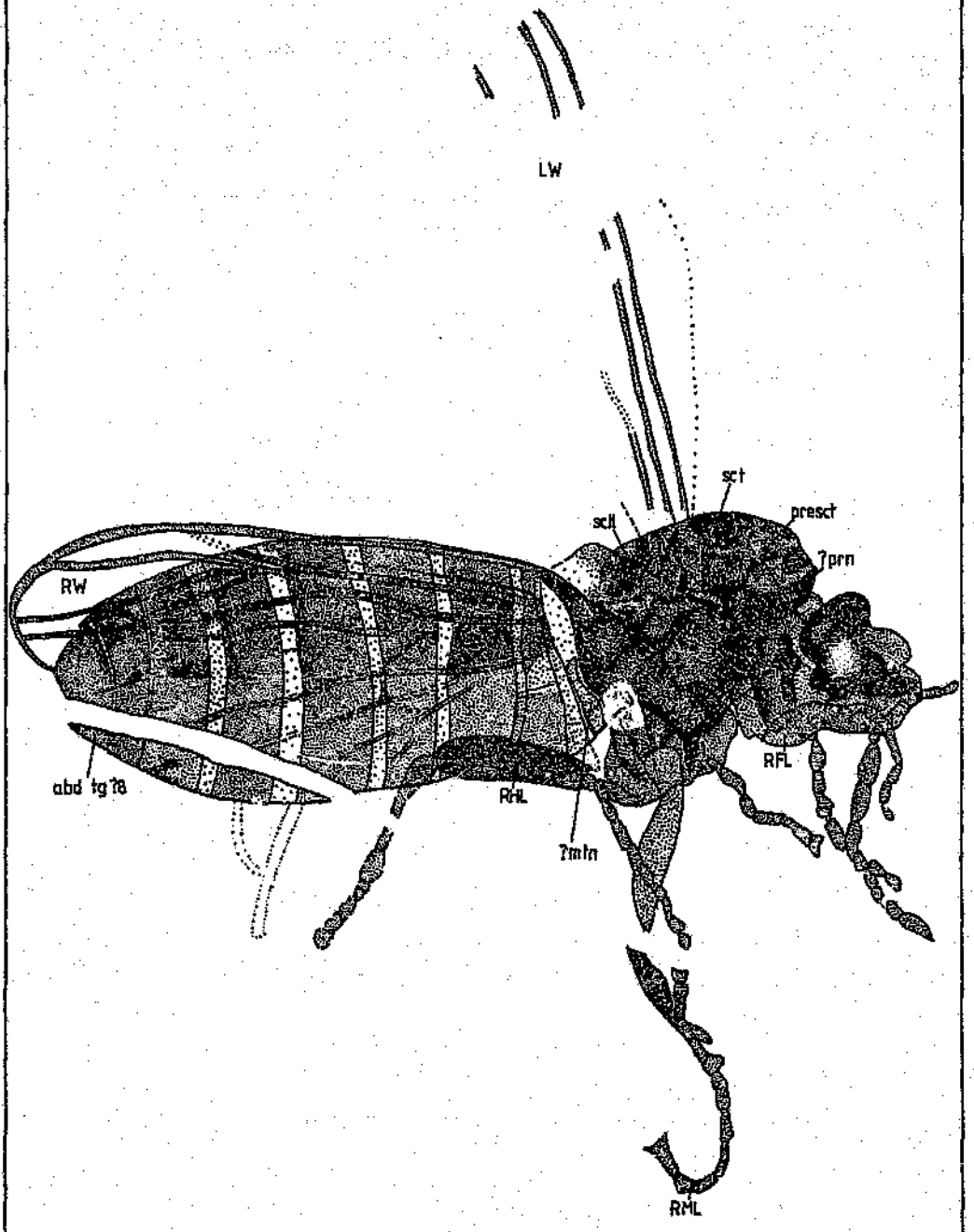
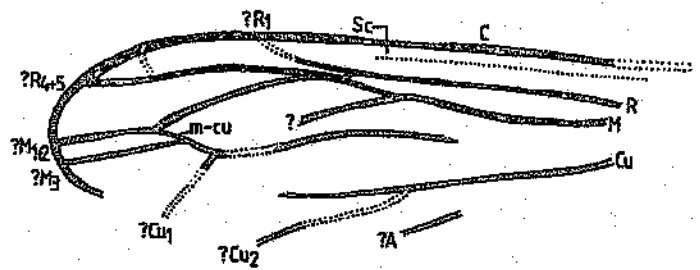


FIGURE 60

FIGURE 61

Family ?

SPECIMEN 8: (BP/2/22455), wing (x36.1).



Right wing

FIGURE 61

FIGURE 62

Family ?

SPECIMEN 9: (BP/2/26872), whole specimen (x77.8).

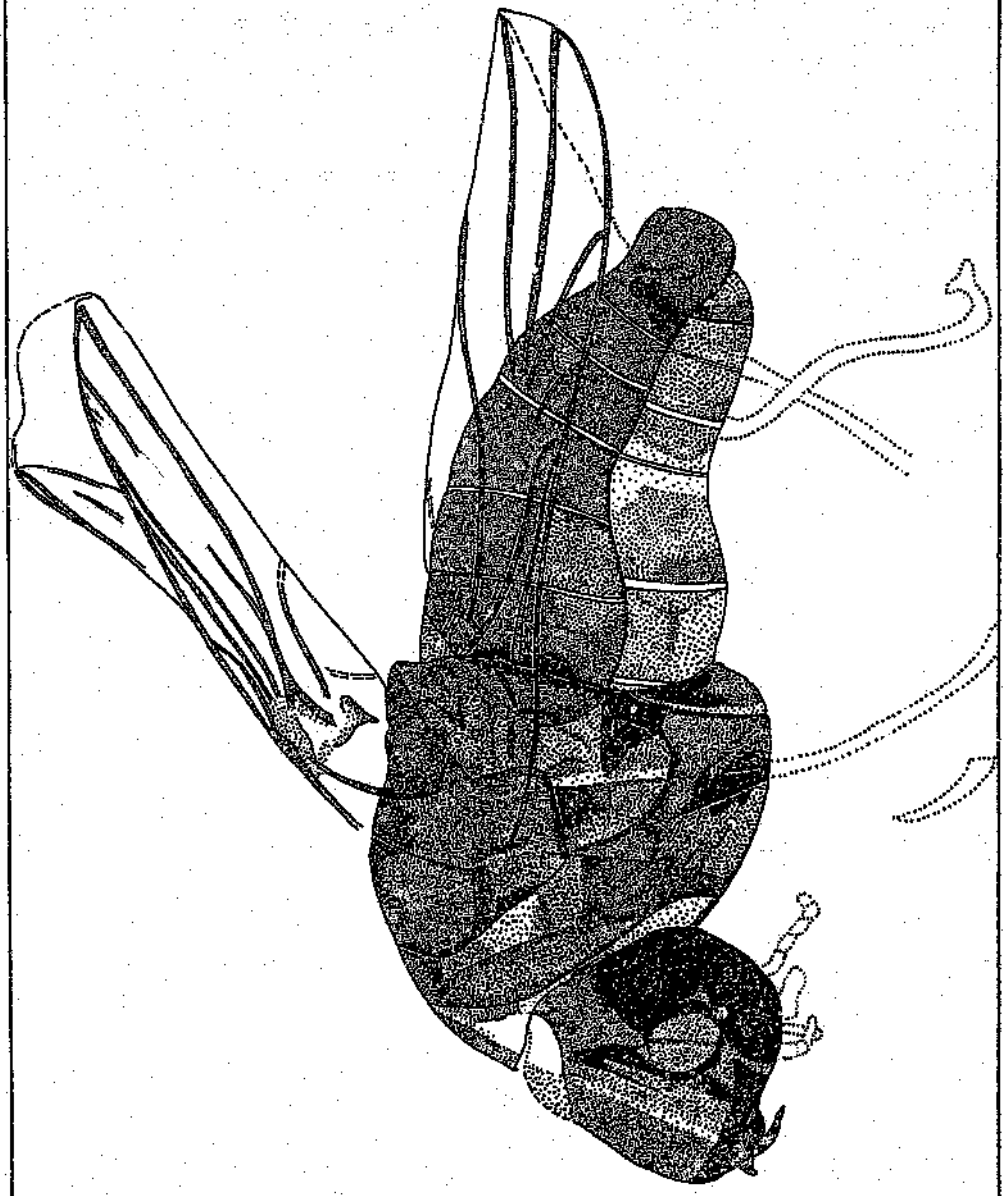


FIGURE 62

FIGURE 63

Family ?

SPECIMEN 10: (BP/2/26238), whole specimen (x37.3).

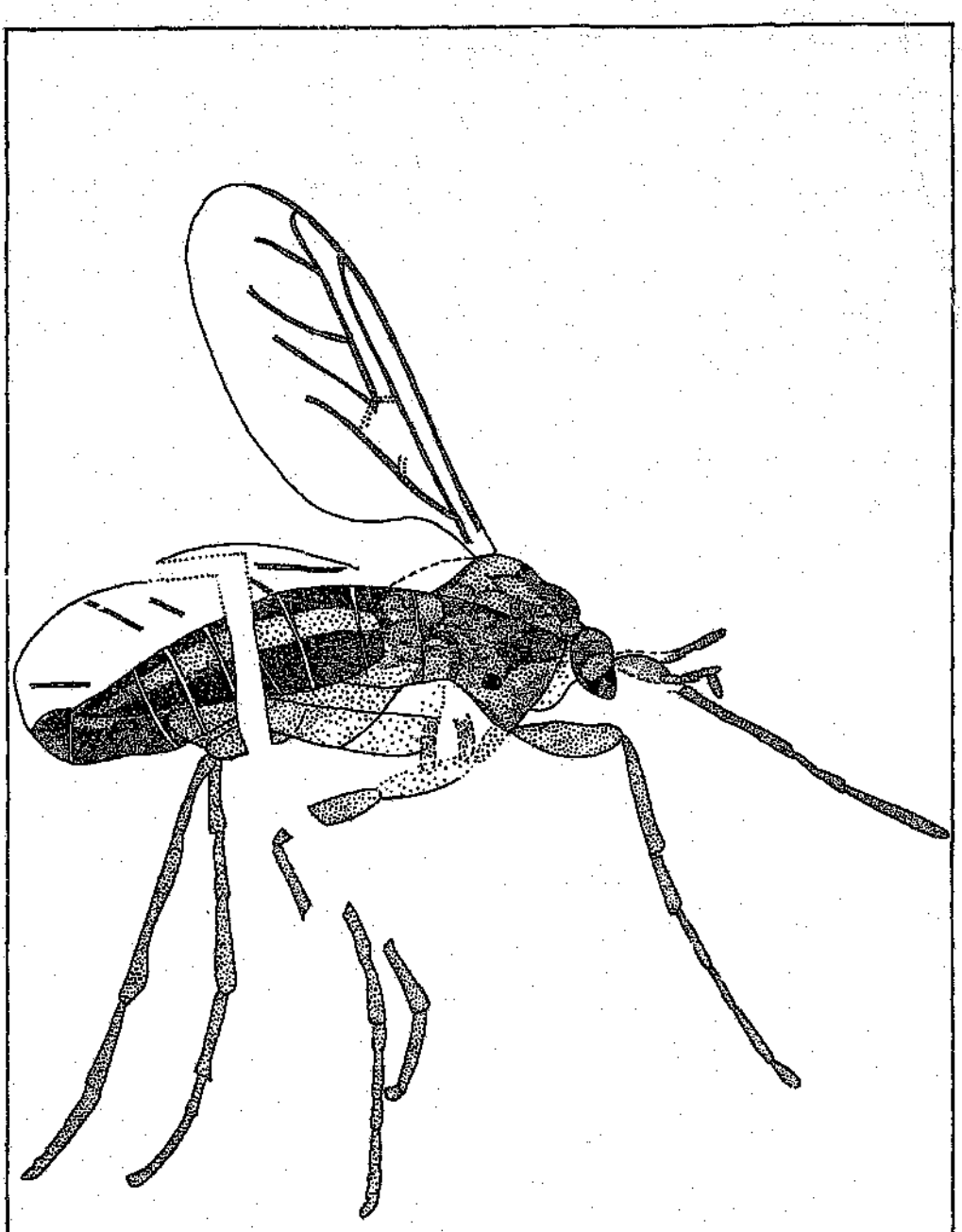


FIGURE 63

FIGURE 64

Family BIBIONIDAE

SPECIMEN 1: BP/2/22454, whole specimen (x38.9).

Inset: details of genitalia (x55.8).

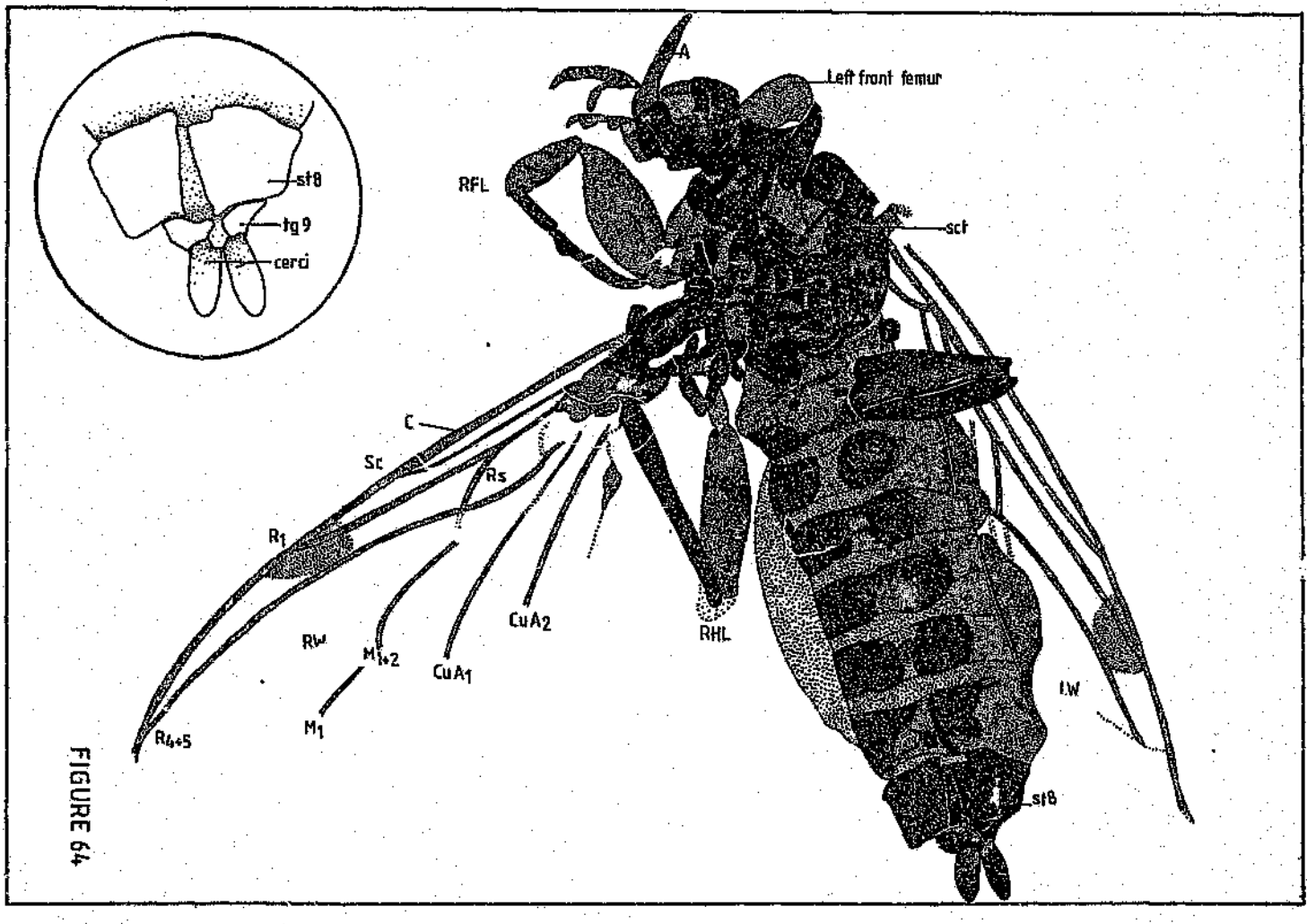

st8
tg 9
cerci
A
Left front femur
RFL
sct
C
Sc
Rs
R1
RW
M1+2
CuA1
CuA2
M1
R4+5
RHL
HW
st8

FIGURE 64

FIGURE 65

Family BIBIONIDAE

SPECIMEN 2: BP/2/22453, whole specimen (x27.0).

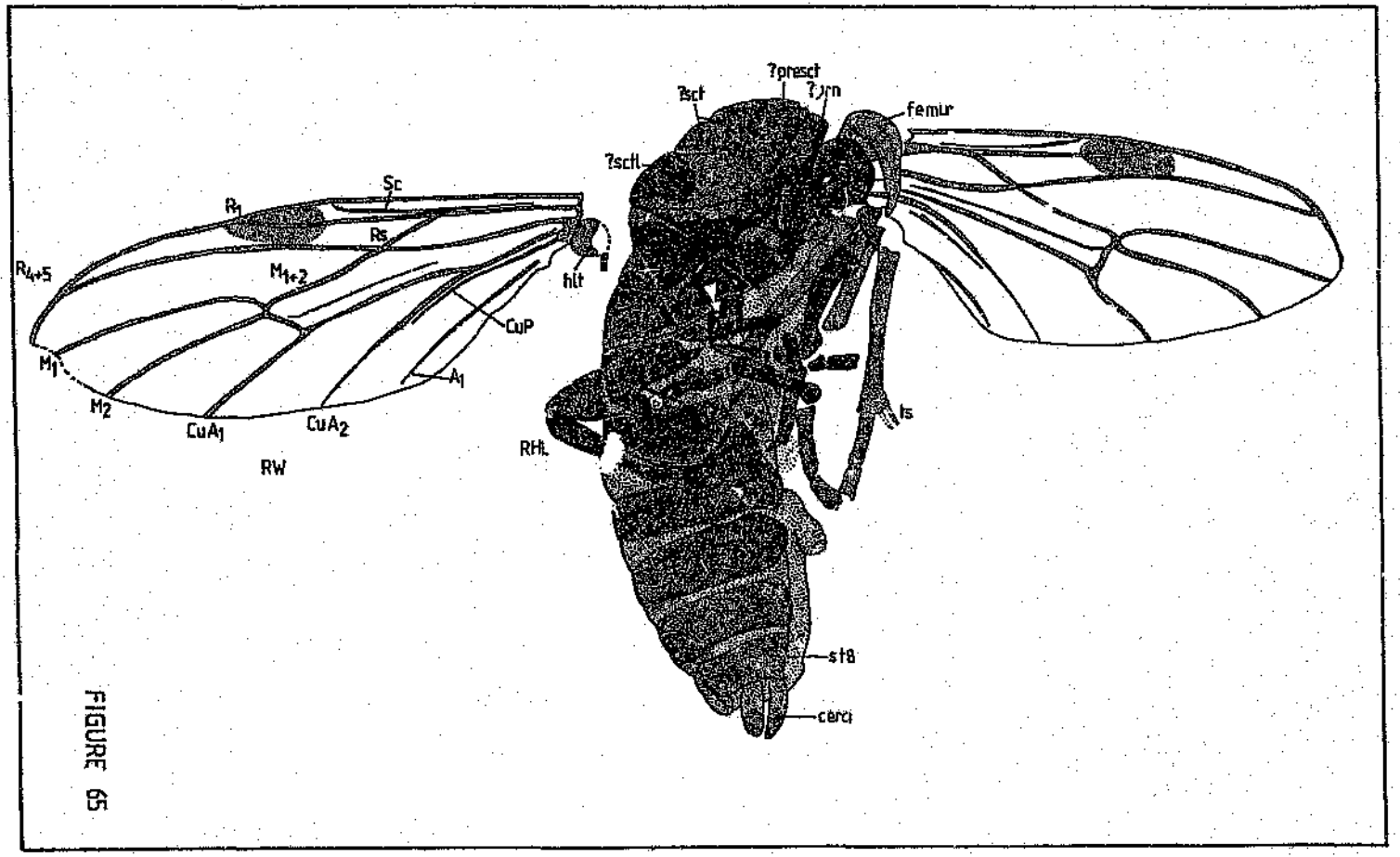

?presct
?scl
?prn
femur
?sctl
Sc
R1
Rs
R4+5
M1+2
hlt
CuP
M1
A1
M2
CuA1
CuA2
RW
RHL
ts
st8
cerci

FIGURE 65

FIGURE 66

Family BIBIONIDAE

SPECIMEN 3: BP/2/22455, whole specimen (x33.2).

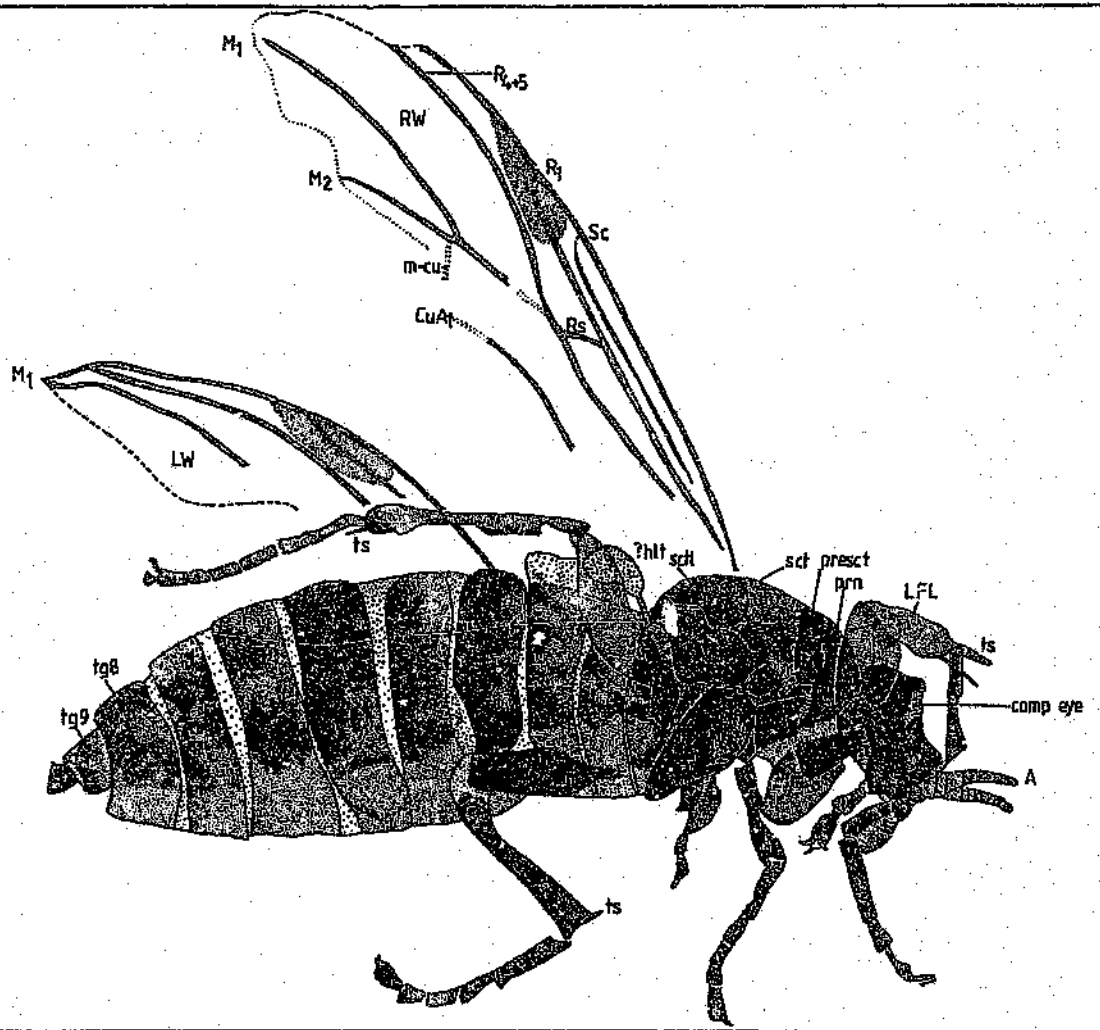

M1
R4+5
RW
R1
M2
Sc
m-cu
CuA1
Rs
M1
LW
ts
?hlt
scl
sct
presct
prn
LFL
ts
tg8
tg9
comp eye
A
ts

FIGURE 66

FIGURE 67

Family BIBIONIDAE

SPECIMEN 4: BP/2/22456, whole specimen (x41.6).

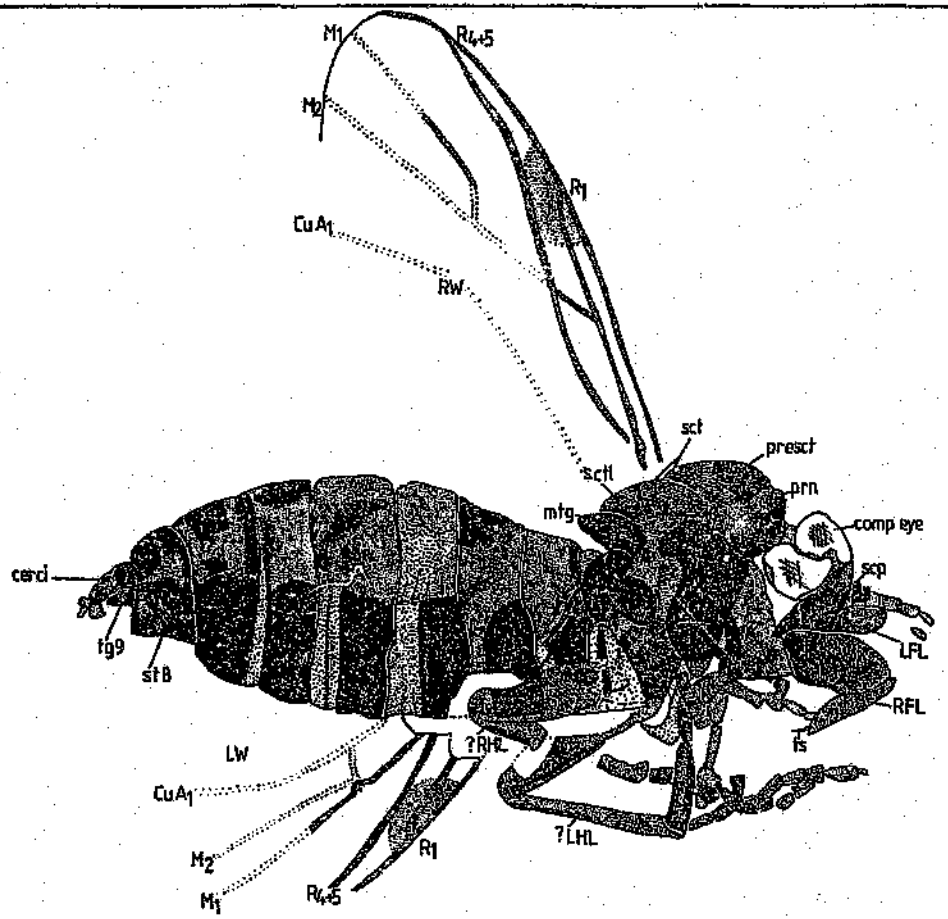

M1
R4+5
M2
R1
CuA1
RW
sct
prsct
scll
prn
mtg
comp eye
scp
cerci
tg9
stB
LFL
RFL
fs
LW
?RHL
CuA1
M2
R1
M1
R4+5
?LHL

FIGURE 67

FIGURE 68

Diagram illustrating the relative abundance of various dipteran families at Orapa.

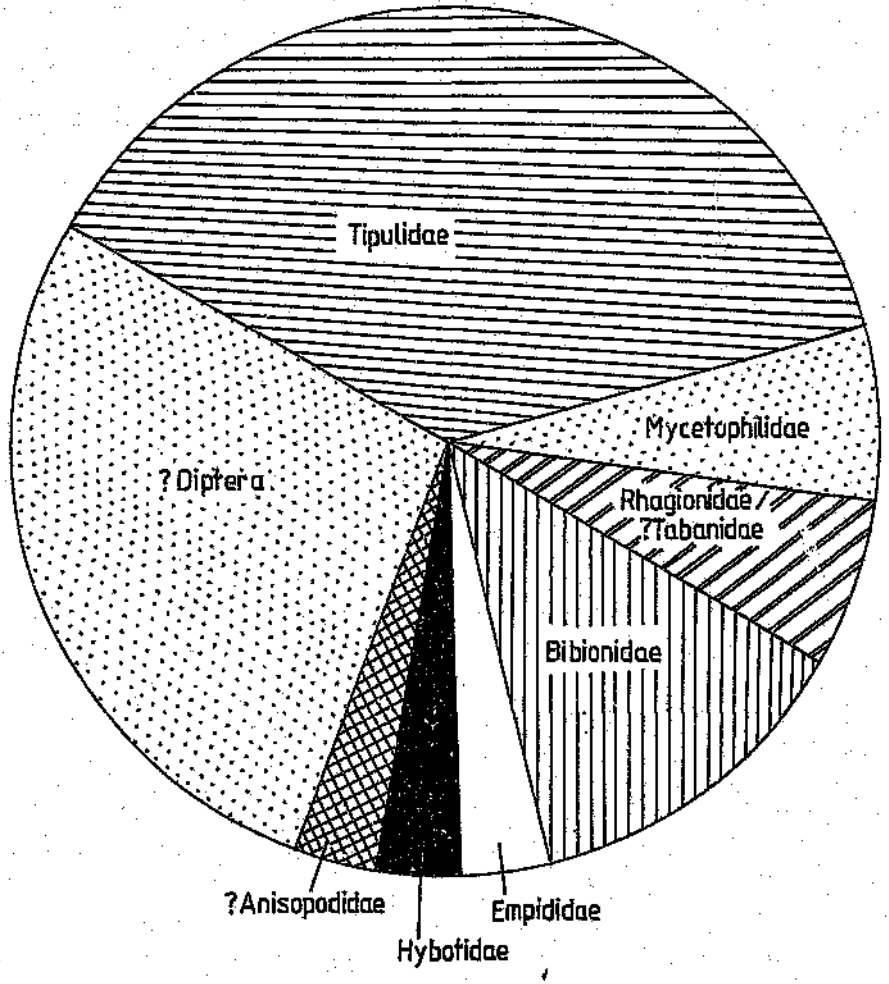

Tipulidae
Mycetophilidae
Rhagionidae / ?Tabanidae
Bibionidae
Empididae
Hybotidae
?Anisopodidae
?Diptera

FIGURE 68

PLATE 1:

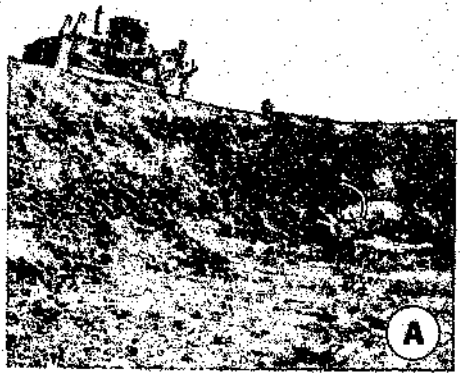
A. Rubble removal from the Orapa mine, Botswana.

B. Access road into the interior of the "crater".

C. Sequential deepening of pit by "terracing" at 10m intervals.

D. One of the students collecting rock samples at various levels of one of the 10m high, exposed rock faces.

E. Layered mudstones breaking up neatly along bedding planes, providing fairly easy access to the fossils compressed between the layers.

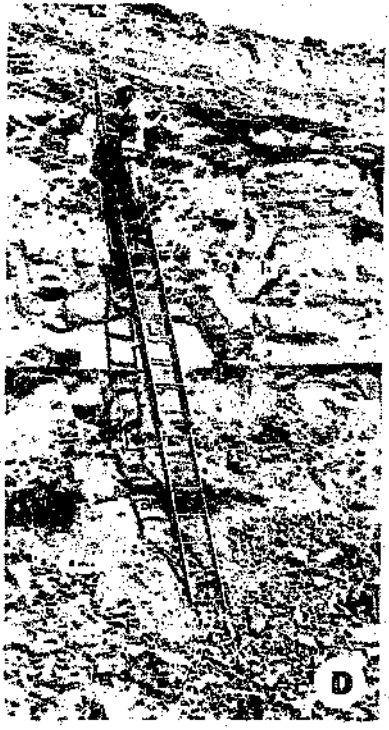




PLATE

1





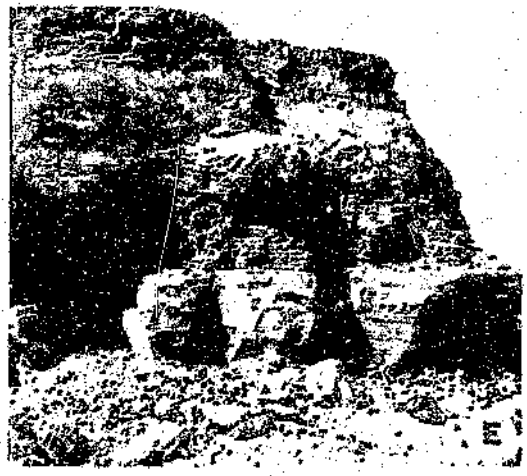


PLATE 2:

A. Composite photograph of the specimen. The Legs are not included; scale bar = 1mm (x13.5).

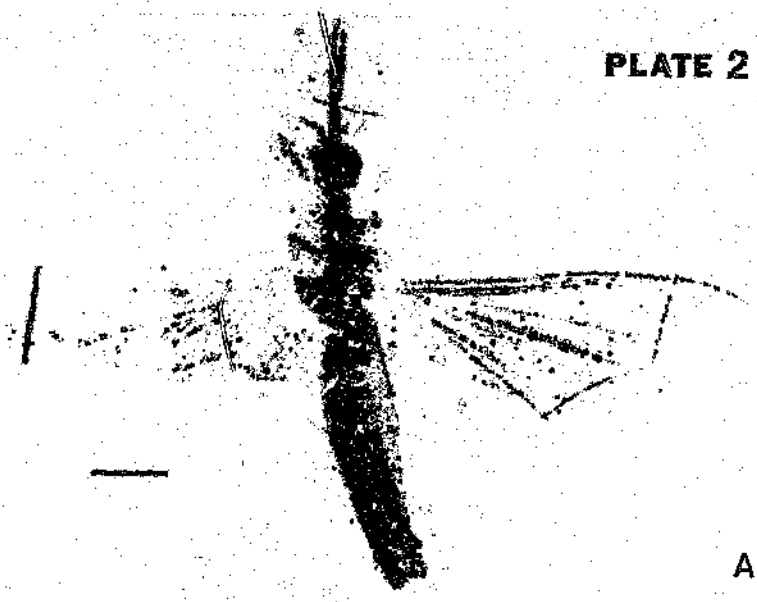
B. Details of the hairs on the specimen's leg; scale bar = 0.1mm (x106.7).

C. Hairs on the leading edge of the wing; scale bar = 0.1mm (x108.0).

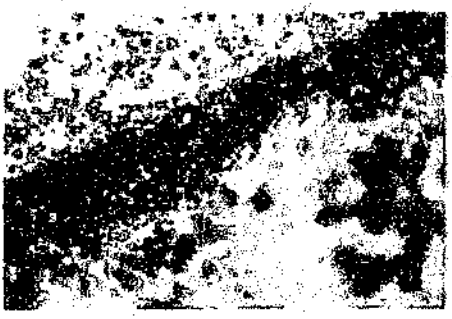
D. Enlarged view of the specimen's compound eyes; scale bar = 0.1mm (x107.1).

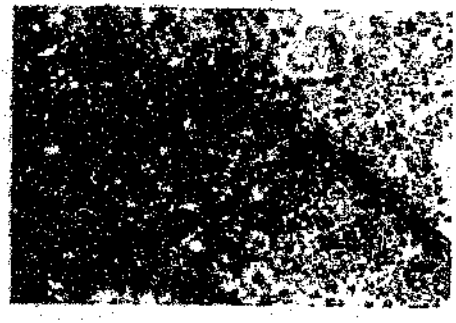
E. Hypopygium; scale bar = 0.1mm (x107.6).

PLATE 2



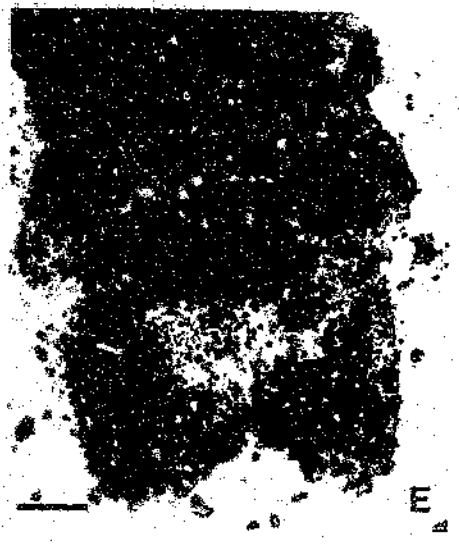
A







D



E

PLATE 3:

A. SPECIMEN 1: (BP/2/27578a - part), whole specimen (x7.4).

B. SPECIMEN 1: (BP/2/27578b - counterpart), whole specimen (x7.2).

C. SPECIMEN 1: (BP/2/27578a - part), wing (x23.5).

D. SPECIMEN 1: (BP/2/27578b - counterpart), wing (x27.3).

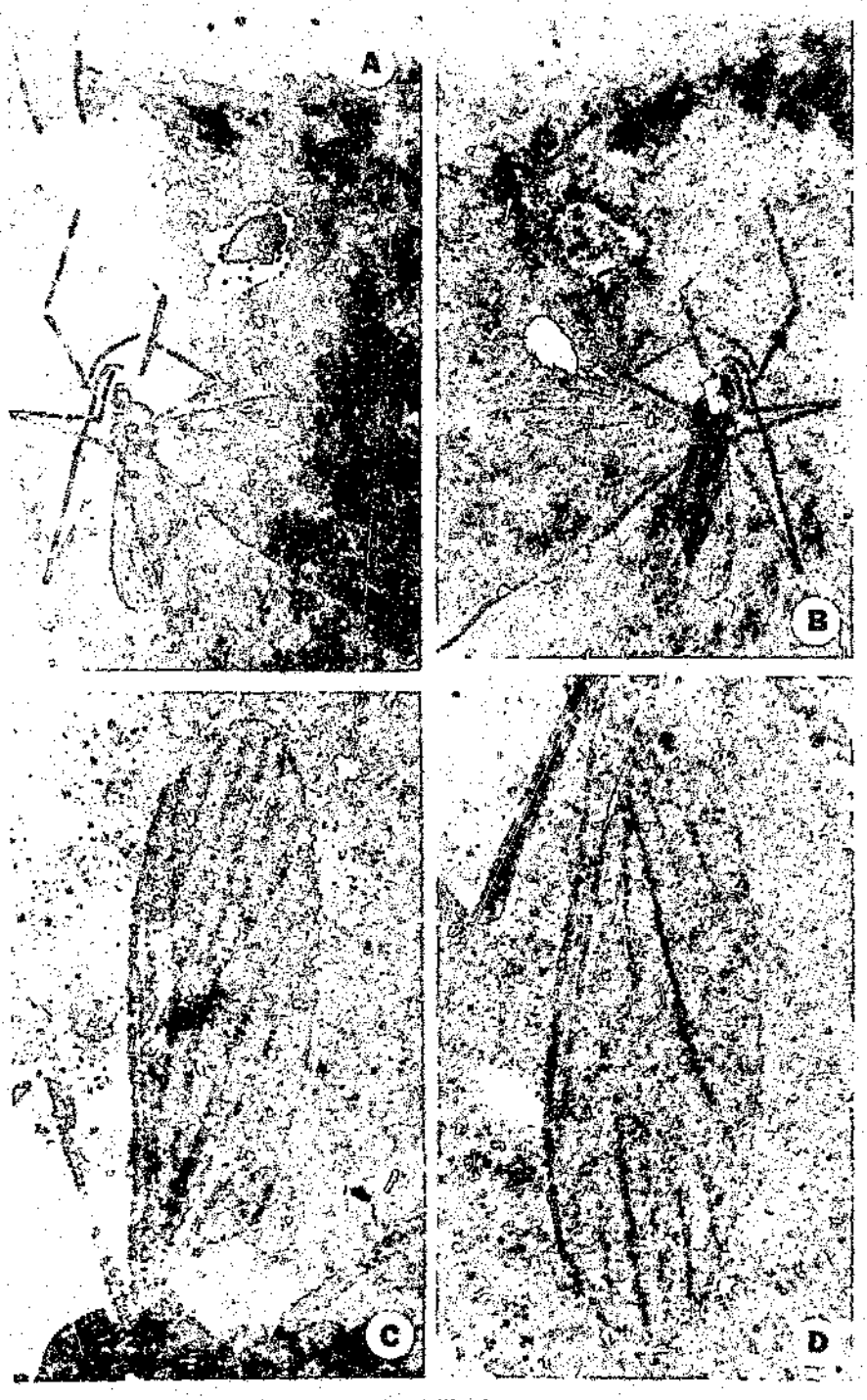


PLATE 3

PLATE 4:

A. SPECIMEN 2: (BP/2/25228), whole specimen (x8.9).

B. SPECIMEN 3: (BP/2/25843), whole specimen (x22.0).

C. SPECIMEN 4: (BP/2/25939), whole specimen (x5.7).

D. SPECIMEN 4: (BP/2/25939), details of left wing (x14).









PLATE 4

PLATE 5:

A. SPECIMEN 5: (BP/2/25948), whole specimen (x7.1).

B. SPECIMEN 5: (BP/2/25948), details of head and thorax (x10.2).

C. SPECIMEN 6: (BP/2/26717), whole specimen (x12.5).

D. SPECIMEN 7: (BP/2/25871), whole specimen (x10.4).

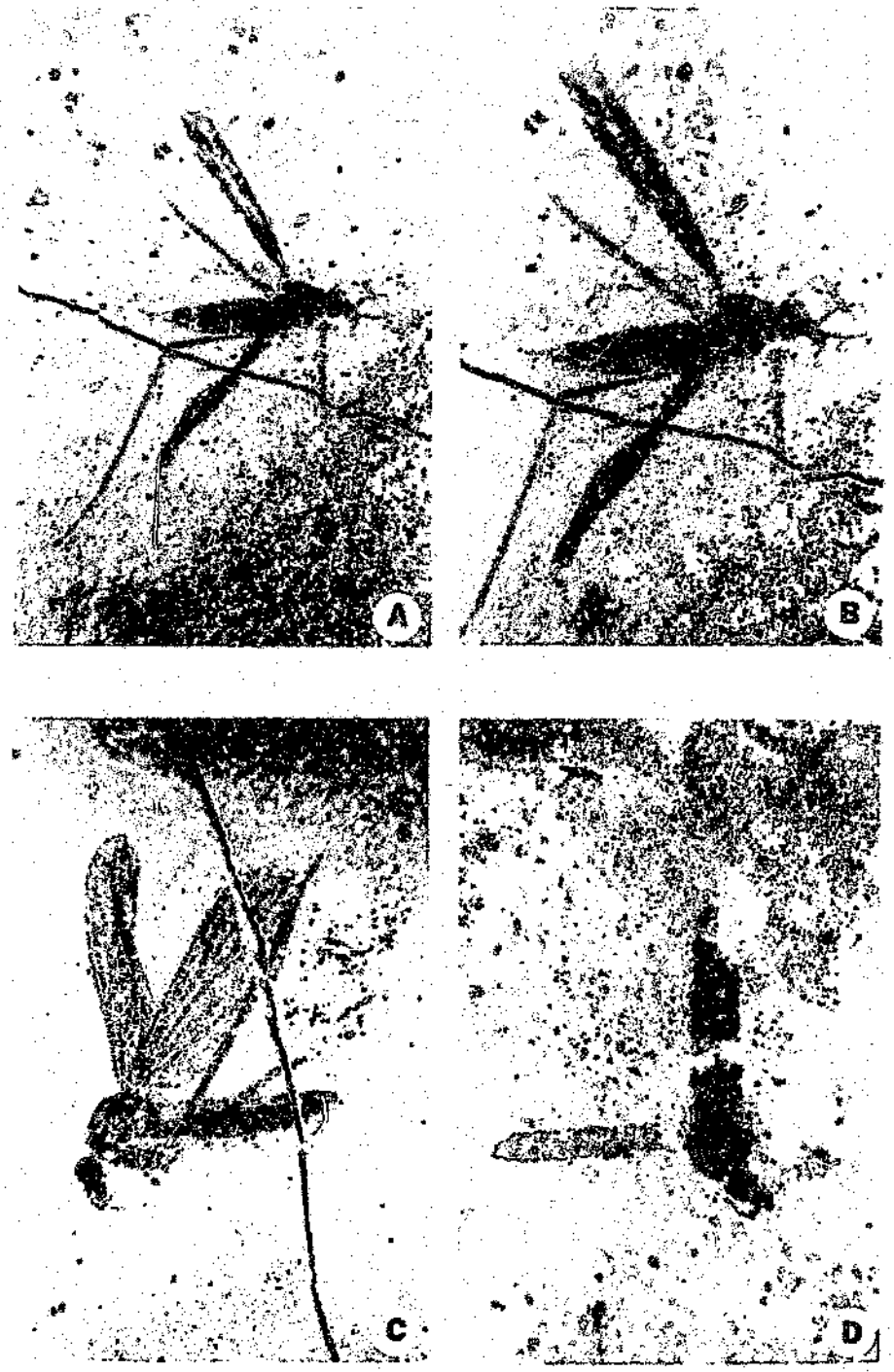


PLATE 5

PLATE 6:

A. SPECIMEN 8: (BP/2/25919), whole specimen (x10.1).

B. SPECIMEN 8: (BP/2/25919), details of head (x23.9).

C. SPECIMEN 9: (BP/2/25269), whole specimen (x8.9).

D. SPECIMEN 9: (BP/2/25269), details of head (x41.8).

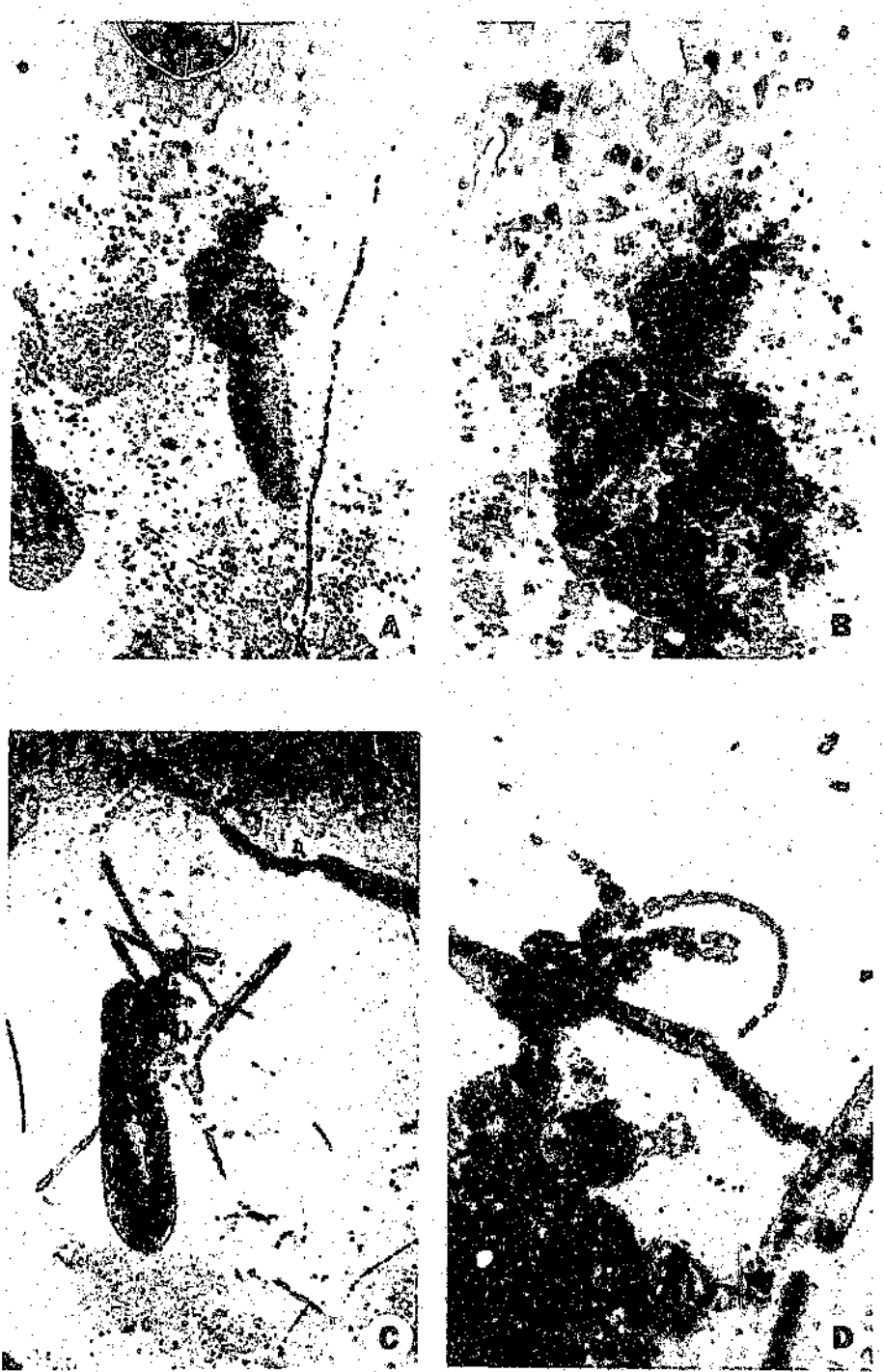


PLATE 6

PLATE 7:

A. SPECIMEN 10: (BP/2/28228), whole specimen (x10.9).

B. SPECIMEN 10: (BP/2/28228), details of head (x35.3).

C. SPECIMEN 11: (BP/2/28229), whole specimen (x14.4).



PLATE 7

PLATE 8:

Empis orapaensis sp.n., holotype, BP/2/26953. ♂.

A. Whole specimen (x15.4).

B. Left haltere (x5.9).

C. Genital segments (x102.4).

D. Tibia showing well-developed chaetotaxy (x161.3).

E. Anterior margin of wing showing microtrichia on blade and stout bristles on the costa (x651.8).

F. Chaetotaxy of a section of the abdomen (x795.2).

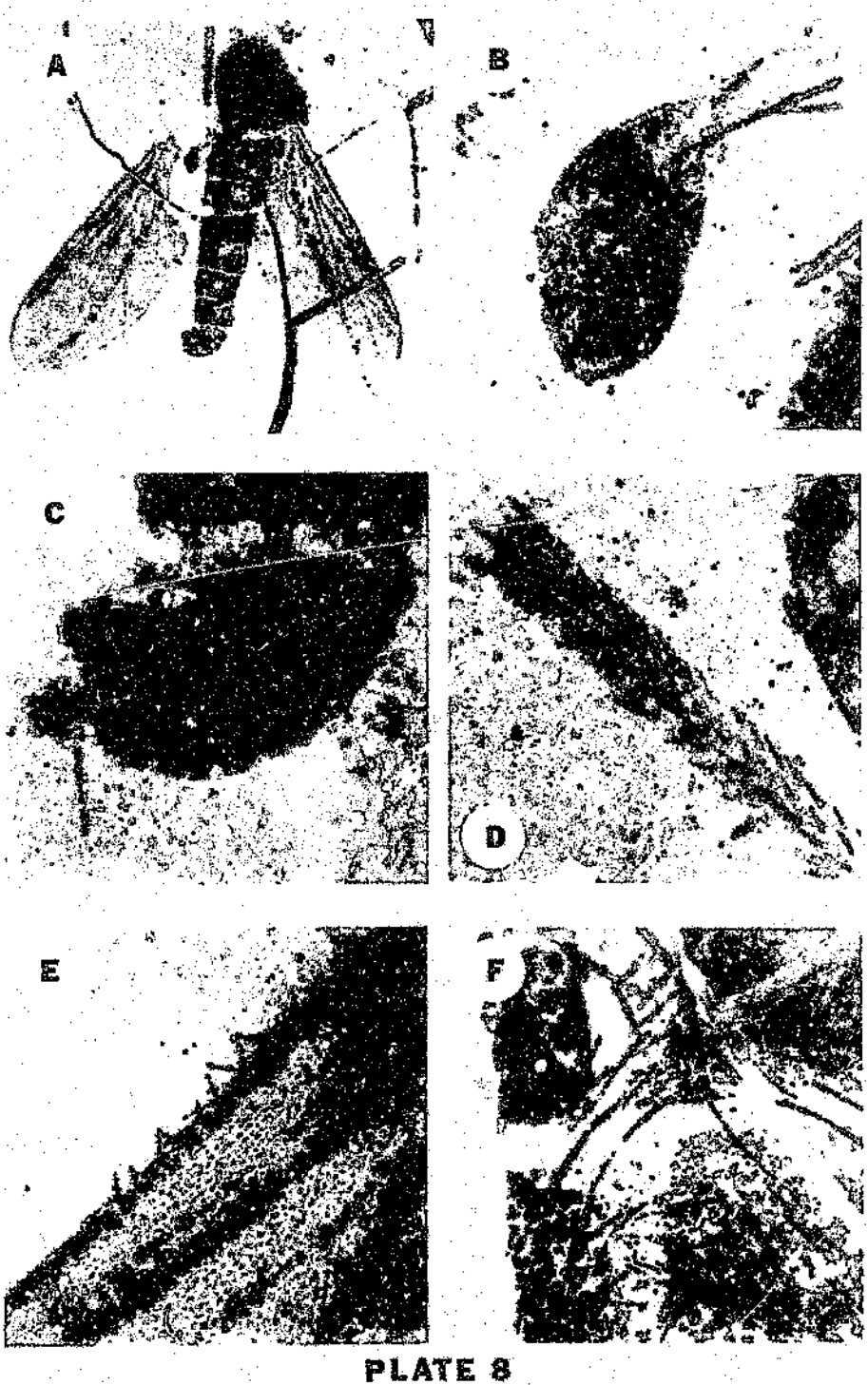


PLATE 8

PLATE 9:

A. *Pseudoacarterus orapaensis* gen. et sp. nov. (BP/2/25224a - part), whole specimen (x16.7).

B. *P. orapaensis* (BP/2/25224a - part), haltere (x141.4).

C. *P. orapaensis* (BP/2/25224b - counterpart), whole specimen (x21.4).

D. *P. orapaensis* (BP/2/25224a - part), tibia and tarsi with 2 pectinate claws (x184.5).



PLATE 9

PLATE 10:

A. SPECIMEN 1: (BP/2/22455), whole specimen (x19.1).

B. SPECIMEN 1: (BP/2/22455), details of head (x64.5).

C. SPECIMEN 2: (BP/2/25896), wing (x32.9).

D. SPECIMEN 3: (BP/2/18217), whole specimen (x7.9).

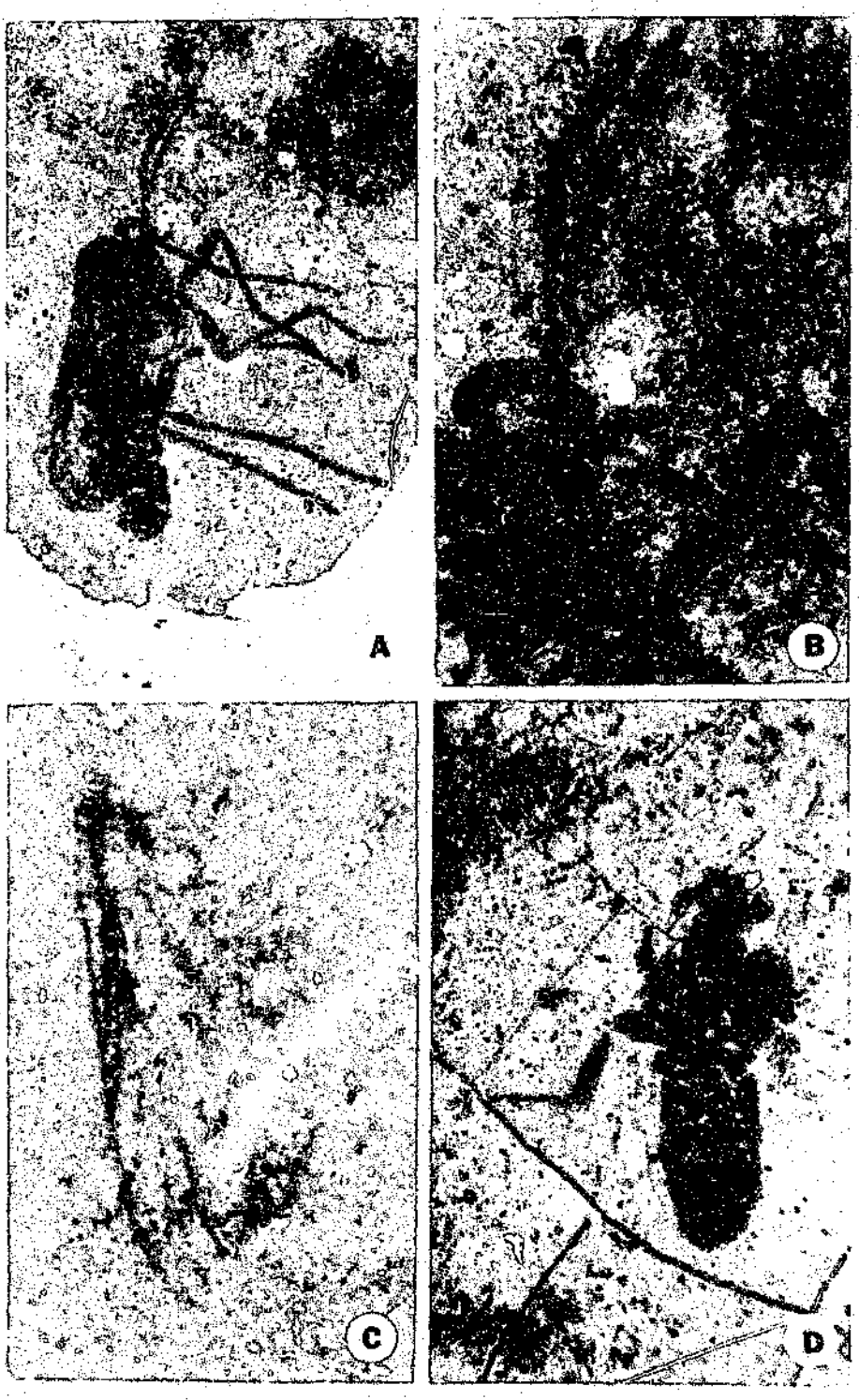


PLATE 10

PLATE 11:

A. SPECIMEN 1: (BP/2/26238), whole specimen (x14.7).

B. SPECIMEN 2: (BP/2/fragment), whole specimen (x12.7).

C. SPECIMEN 3: (BP/2/25974), whole specimen (x12.8).



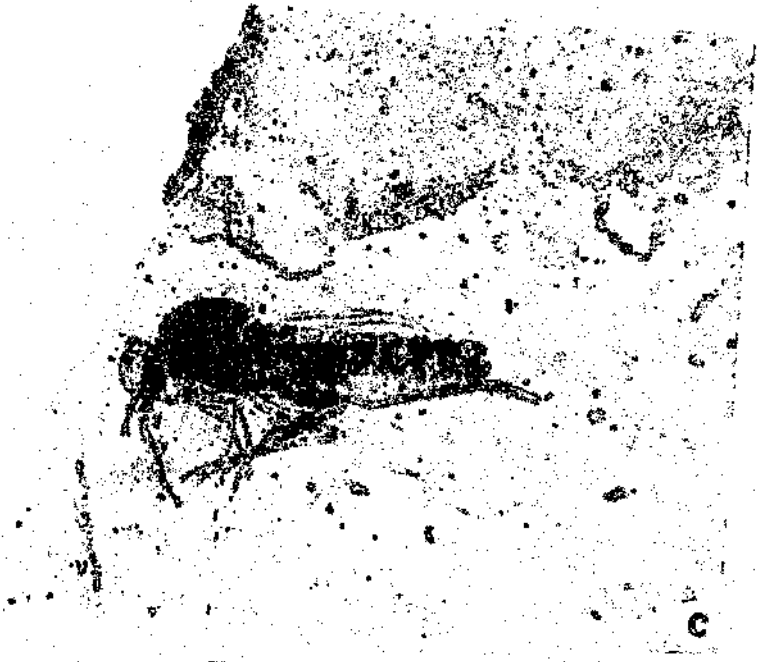


PLATE 11

PLATE 12:

A. SPECIMEN 4: (BP/2/26852), whole specimen (x26.7).

B. SPECIMEN 5: (BP/2/25911), whole specimen (x6.8).

C. SPECIMEN 6: (BP/2/25911), whole specimen (x19.9).

D. SPECIMEN 7: (BP/2/25859), whole specimen (x17.6).

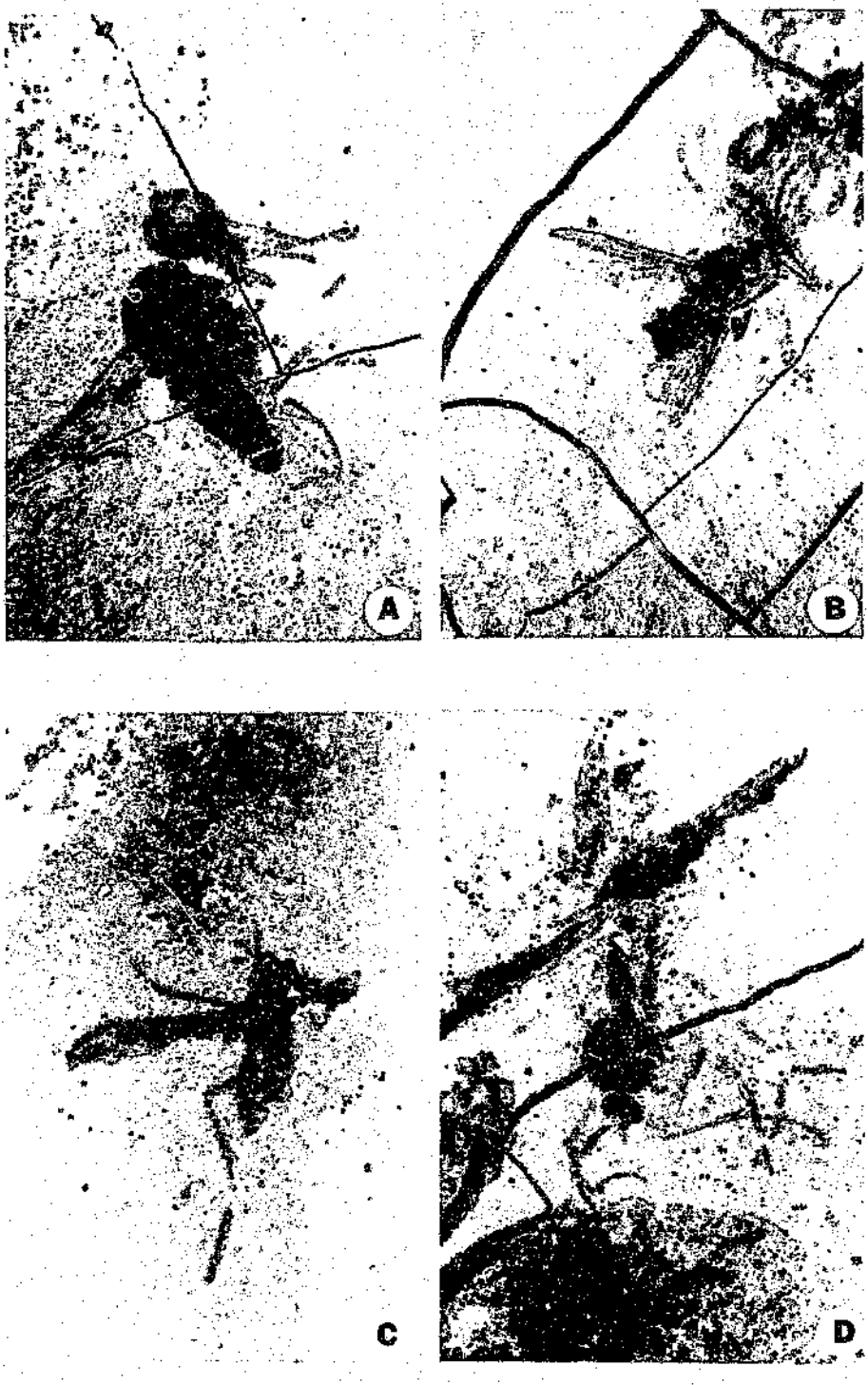


PLATE 12

PLATE 13:

A. SPECIMEN 8: (BP/2/22455), whole specimen (x9.3).

B. SPECIMEN 8: (BP/2/22455), details of head (x21.3).

C. SPECIMEN 9: (BP/2/26872), whole specimen (x22.0).

D. SPECIMEN 10: (BP/2/26238), whole specimen (x10.7).







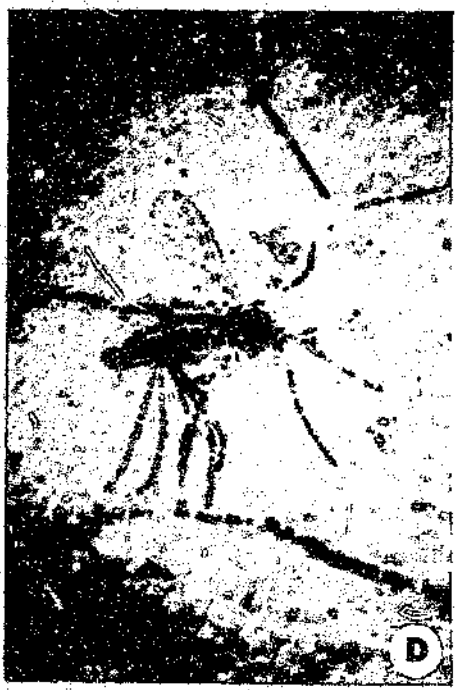


PLATE 13

PLATE 14:

A. SPECIMEN 2: (BP/2/22453), whole specimen (x18.8).

B. SPECIMEN 3: (BP/2/22455), whole specimen (x12.8).

C. SPECIMEN 1: (BP/2/22454), whole specimen (x15.1).

D. SPECIMEN 4: (BP/2/22456), whole specimen (x17.5).

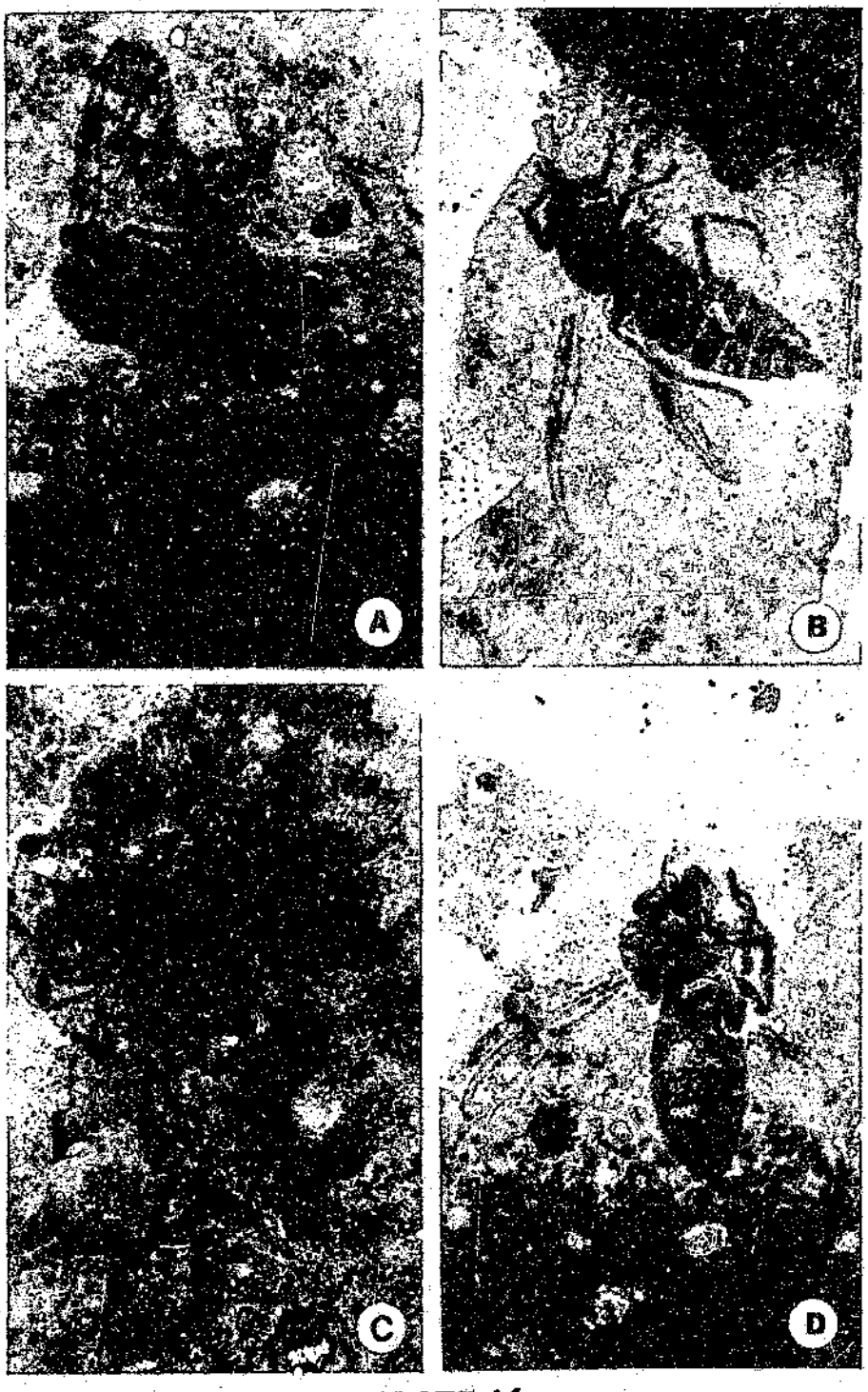


PLATE 14

Author:Waters,S
Name of thesis:Cretaceous diptera from orapa, Botswana

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