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ASIATIC SOCIETY OF BENGAL

VOL. LVIII.

1

IX.

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p. 1—1
pp. 1-

LIST OF PLAT

—

[.—**Psendopulvioaria** sikkimensis, D. sp.

10UUS.

sp. nov. and PerichiBta honll«

fte *Doah and*

X.—A

vl.— *Head of Cei* -skii.

XII. \

XIII. \ *Sj* Pnciiua / *ila.*

XIV. '

XV.—*Nei* *Celt /rom Jashpar.*

XVI XVII. '

Plotiro

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XIX X

A.)

XXII, _5 *'lure Fishi* *the Bay of Bt*

XXIII > _ Ljcwn »^m *Tenasscri'ti.*

JOURNAL
OF THE
ASIATIC SOCIETY OF BENGAL.

Part II. — NATURAL SCIENCE,

No. I.—1889.

—By E.

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(With PI

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Mr. B I, h

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been to show its conii
 The insect IB really a heniicoccid possessing more-
 thai ' the groi[^] mi. T
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 the femaL lie second ir along the mi
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 to which : iro attach.- The secretion is <
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 PSEDDOPU? Sp.
 Adult 2 , above r -brown. I, some
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 insect frequently falls o
 to the twig. l od beneath with .
 the abdominal oli
 tubercle, G-jointed, a
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 longest ?>.
 Tli.
 kite cei
 ie insect itself, ^
 scattered irregularly over the nether crudal
 in g >und only on i
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 i midrife Tli

, 'occi.

ET1F0

>iy to a longitudinal median ridge a
'ibhed appearance.

ui is furnished with antennas, legs, rostra:

f the larva (*Vetat* ; Fi I an
group,
uiknown,
plm (3800 ft kkim.

PLATE I. os:
slightly rodaced,

.fuficd.

90.

dorsal

xy plaiss.

—On i of ThelyphonuK inhahi
ami tfie Malay Peninsula.—By R W.

"P THE ;

pril 3rd, Ib

(With Plate II.)

The obscure auimo Sh bolong to
mown. this go

I have steadily
and not loi
eciinens contained, in t! i
indly placed at my ■ i by Al n, the £
" the museum.

There are now fchi
hich three have been all o
are unknown to me,

ver The ^escribi
-ears ago and in terms which, when a]
,1 together insufficient, hot

paper, and I hope to em oc
d time to examine the which I uu-J
lusenm. These tw' are T.
Ceylon, and 'J i'otn T<

live under timber and stones, lying < iλ
iho day time and cri- bout at niy;b' -,jd, !
seem ovorcome with surpridc, but they speedily r urry av
with considerable Kpeed into holes and They =3 and
found at the roots of trees nn omul: I toil.

I have never found tv, uid m
oach species inhabits a tract of count xclusion > re, Fc
instance, in Rangoon ' miles north
this species ceases aud T T,

saxatilis is alone found to o
ita peouliar species. The species which so far as I know hi ^st ■-
area of distribution is T. indicus, but th< ts "Western Bengal
and Southern India " attached to the few specimens I have been able
to examine are so vague that no certainty can be attached to this

when once you get into the way of finding them, are
sufficiently abundant. I have frequently found twenty in one inorr

and, on o m, wliilo visiting tho lighthouse on Double Island, I
L threo hours' work, myself and one mau.

All tho species I havo met with t poculiar odour, *nv*
,m anything el so I know, but more pungent.

Tbia

n- ema from a liquid which is ejected from an orifico noa;
of tho tail, and so powerful is it th;> is frequently bet-rayed
the position of£ tbc animal. On one occasion, when'examining- a
live tnixnal, I had a drop of tho liquid injected into my eye, but it
proved to

animals, it is hardly necessary to state, are quite incapable of
inflicting injury to ai g lf>rgo than an insect. They have *nr* and
thei y weak. A writer in the ;c American"
describe ues common in
killinpr its sting. This
is

cou;

ng th(
)ft); I have taken tho very youi
and also what to bi >tfenia.
:■ eggs HOI them, MJ , the ener-
rtow wv Banna, informs me, ho we \
egg under

her

jophalothorj - the aid of her first pair of logs. TJ til I laiow

Th> olutely aliki nil
ho nut >omo process upon whi a able,
am to say, to throw no light, uuderous and
emerges fix>ni it totally different from the female. Thai ct cau
idmit of no doubt. Adult males are nearly as abundant as adnlfc

females,
jut half or three-quarter gro' th the external chfl 9 of
the adulfc male, or with any characters at all not pos- by
the

female, artf tmJ L Oneo adolt the sexew are as different as po^

Ippeai
in all eharaci
icept colonr, *ta* >ect the differences are not
great,
reds being replaced by olive-}fel! s and black tints by

pink

mes.

In gi*owlng i-

7 seem to undergo numerous mouUs just

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l the species I know.

The more ma ^e and armature of the cheliceres,
but there are minois.differences, such as the grooving or entirety first
lower abdominal segment, the size of the abdomen, and the colour of
tho cheliceres,

cognized by o
 I the first lo*vor abdominal segments not o
 animal. «pend; have i sta
 In my , -tions 1
 of importance, chiefly the details of tho chi **aad**
 10 important points of the cephalothorax and abdomeu. I uot
 found the legs preciablo degree in tho different spei:

vc omitted tlu
 It will be noticed hi th. bat the fomali
 discriminated from oach ol
 los are -*s my
 in into I
 are sufficiently distini ■; in shade of colour, shi
 ihelicures, and in other p
 Thex-o aro many immature t:. ian ilasoQni whic
 have hesitated to describe • ; i
 many of tho i is of theso anim;i
 rous specimens, and, if so, they are wso loss,
 3pocies (which, when fclly distinct) .

On examining the specimens which the lato D ^ed
 T. «> P* 1^i), I the
 3pecimons wer« the young of T, a
 ePv -ang, ti

Uarp rid "al aud I at oral

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 an well as a terminal on
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. Apophysiu of tin t joint of thi.
ceres sharjily triaugui

st pint-of ub
 j second joint genoi ally with 0 tec



;d longi- •' and 4).

by a groo

ove very deep and distinct (Fig. 3).

o* MoV nger of eLelicores
festooned

orly (Fig. »); the terminal joint
the chelicres of large size, broader
an the fourth

Me " 'iblo finger of chelieeres simply
rounded interiorly (Fig. 11) ; tho ter
minal joint of helicerces weak,
ourfch,

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lominaJ segment tli

no I

central aud

;ral eyes, this region being rov.

A| LU-th joint of chcl long and
smooth 'denly

I qnadrately widened out on tho terminal
quri ighth (Fig-. 12),

£ fourth jo liceres cylindri-
cal, smooth on bofcl'

;aal half oi i-'ig. 10),
>urtla joi. os abso-

lutely **drical**, tl

iLroughout thiiii' length and smoo

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Length of abdomen *a* lialothorax 1
inch,

liof abdomen and cophalothonix 1 in.

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Thelyphoi!

Coxa and femora of three limbs: are of legs reddish-brown, the other joints,

a) Apophysis of fourth joint gently swollen near the tip only,

7A Apophysis of fourth joint greatly swollen terminal third of its length, syl

Apophysis of the fourth joint of the chelicerae bipartite, pointed, serrated on both

abdominal segment broadly rounded posteriorly (in all the legs red, *hinghami*, 9. *retro* abdominal so, *retro*-trudin.

in the legs uniformly red, 5 v..

Coxa and femora of all the legs reddish-

• *retro*, the other portions red, *retro* legs uniformly the first pair reddish-brown, (..... *retro* 9.

1. T. *retro*, PI. II, Fig. 1 1869, pt. ii, p. 205, pi. xix, fig,

B. 1873, pt. ii, p. ISO, pi. -; ■ 1. v, fig. 2 (187

ad cephalothorax bipartite, dorsal joint of chelicerae black cephalothorax, abdomen, and legs deep blood-red. *bent with the chelicerae slightly

retro. 1. *retro* with

>: *retro* brown. ■ > inch. of this species of an uniform madder-brown *retro* is probably the normal colour immediately the *retro* of *retro* *retro* *retro* Chelicerae densely and coarsely spinulated in every part; second joint with five teeth on the front and lateral edges, always two lines below; third joint with a very long spine below fourth joint very large, with a small spine below

fpop1Jy „- fTOu I rical,
 .,ie and below with numerous teeth
 io (Fig. 13) ; fifth joint muc- fourth,
 gular almost smooth on both edges, movable
 I below, in >o much as in Fig. 11
 ;
 on the lower projecting angle of the joint; first joint
 iictred and slightly wrinkled in places;
 u'ior] with a lateral spine as well ■ ! oae I
 thorax ly granulated all over with a very pronounced sh
 oen the lateral a ad middle eyes.
 abdo :egment wriuklod in the midvi od
 . C
 h fire tn front, and :
 tint spine on the interior edge and a long, sharp one be-
 oint withan below aiid n. tr, pointed
 jjliysis on the interior-front corner sermted on both edges (Fig. 8) ;
 th j «r and feeble, fixed fingt vply triau-
 ith edges, cer longa nd ifced,
 cur 6), si on the i cholieeres
 an in the ma]
 Ceph: in the male. I »minal segment below
 -g in no respect fro' ihe male,
 and : it Assam and Sikl ad the bill-. of
 : Cach:, The late Dr. Stoliozka appoars to have been
 ignorant of tho gr
 ice of structure bofcv ie sexes oJ uimftls, and I
 scribes the two sexes under different names. His name has priority
 over
 Mr. Butler's by four yea liis species is widi md
 be common, am! oqaenily, we may snnpecfc, known to
 , but to
 well, it Dr.

Sfcoll ead of making fruitlcsa attempts to J hid an i
 one.

2. THELYTHONUS INDIGUS. Pl. II, Figs. 1—

atoHczka, J. A. 9. B. 1873, pt. ii, p. 138, pi. J.
 A. S. B. 1873, pt. ii, p. 142, pi.

Cephalothorax and abdomen dull chestnut-brown
 it; legs and tail deep red below, cheliceres de- -tnut;
 •num, and legs bright chestnut. Length 1'Sia

9. Similar to the male in colour.

hOrf [No.
■ asal j0

JO;

■ joints, ,J;■■'
cm-v-ed bactwar,,,,, cloaefy TM TM ,f

broad, finolj- ■ tria,-
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odgesinnal

t lower abdomin:,
‡ -ooovo,, divide. ,,,,

ntimber of teeth

Sonloi

i on each side (T) >
All ^ ' />

lived for me to an any conclusion on
out the examination of his type, and for this I have had
jrtunities.

a. sp., PL II, Fig. 11, '*.

alothomx nearly black; abdois
Lder, i the extremities; below,
i red; abdomen, sternum and
exinguinal h. 1*2 inches ; (iheliceres "5
inch.

!a; slightly smaller.

Cephalothorax and abdomen red, logs brighter,
t-red.

■!y punctured all o-
usoly punctured, with six teeth on I oral
and two strong spines below; third densely puuc ill over,
a very strong spine below ; fourth joint dengi ired, wit!
recurved triangula: rated on tho outer edge, and i
ho outei > joint.(Fig. 11) w(r than
punctured, fixes ted on tho ov with
e on.fr- ido of the join*
I on tho i a few spines on tin

ax densely granulo , the space between the
itoral eyes ridged.

First lower a deeply longitudinally (Fig>
ud rounded.

Sir ■ Similar to tho m t tho apophysis of the fourth
:nd broatler at base; first lower aV
oove_r and pointed posteriorly.

I have a - s after the t ■

PI. II.

■ I chelicces dark retl, the logs paler red, the
, cholicercs dark
.1 joinU of]■ tail i
ii 1 inch.
to the mule and of same size.

D.

.. ilioeres smooth \ py few m
id with a few obsolete teeth on t'o
Btronp' .spiius b<

9 lowei
 low nut with a
 i'ophys is about felv
 j lind'
 K ?id oat 01
 rwte ■ -v tion. an < i
 j ^ e c u n
 edge i I and hed wi ara, tin
 • oruble finger curved, t
 and serrated below halothornx
 on
 tumid but not j lower abdom
 sinuated
 the structure of the
 menfc. Seo it of c
 ;:ve distinct on th | e ot the ant,
 four on il, theforem at tho
 the others, which avo all of equal
 8 p mei anpfac; joint with a si ,oth c
 are and one below; Wth Joint with a short
 triangular apopl serrated; fifth joint as in tlio n,
 The first 1
 I have much plea
 son, the late S, . - Indian Uu.,- ho din
 Upper Burma. Th 0 seco
 Tho only [o of tl
 scribed it to K > wer
 out of my koj ; when writing which I
 IOSU3 WOOD-MAS)
 *. and cepbt.
 tinged with red
 ohe rcd dis L - l > ro
 se ? mi ■ remainder of abdomen darker / 1
 9 • S the male in colour.
 abdomen doll rufou ■ coffee-brown, cepl.,
 (, j l rcd dis h Vim d < ykc - bn
 b, male 1 ic ii; female, -95.
 very ill
 over, the exterior angle of

> blunt spin ■ at **with**
 >r edg to the the
 h joint very ie belo
 from the antero-lateral corner, the first liall
apo; **I** broad, the terminal half about half thickness of
drio middle, \y terminated n.
 at the end (Fig. 10), the inside of **the apop]**
 indod process of fifth joint large, rounded on

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ia thorn fauUlated, the piece bet\ v

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 ii, the energy;

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a. ap., i
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 .juvfch a joints of tltc
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 first joint of .

L'BQ:

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 ited and wrinkl- the anterior lateral c
 and ginfl indi* in nabor and j
 ud obsole tow. Third
 over and coarsely granulated on the iunev edg Low.
 with very few pom
 and cylindrir minated wit blun
 rounded process interiorly near the ond (Fig. 7).
 and round, very nearly 1 finger shoi'
 broad i on both v movable finger i
 cd and sin uated within (Fig. 5). First
 very sparingly punctur-
 CepL granulated all over .nisvorsoly wrink
 the lent smooth in I Idle, not d
 groove*
 8i pper surface of chelice i i.;
 «riugly
 throughout, 2nd joint with five very distinct teeth on the front
 lateral edges, of which the two on the front edge arc the la
 h on t\, irface; third joint with a tooth on the interic
 and one below ; fourth joint with a tooth below, the apophysis trii
 g-ular, finely aorrated on tho outer edge, with two or three tooth on tht
 inner (Fig. 8). Fifth joint narro he fourth, fixed fin;
 triangular, serrf* tho outer edge, also on the inner edge i
 down to the linger shorter thau
 pint, gently curved throughout and serrated interiorly.
 "er pai the iirst Id

abdominal segme
 This is common
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7.

abdomen reddish brown; legs entirely black; joint of the cheliceres immix-
red; lower surface dark chestnut. Length 1 Inch*
5- similar to the male in colour, and somewhat larger.
Cheliceres brownish. Cephalothorax black. I
reii I the legs olive-green; remainder of the legs and the
de reddish-yellow, darker on the first joint of the

Cheliceres, very sparingly punctured all over,
the second joint with a few wrinkles across the exterior portion, and
with five more or less obsolete ones on the anterior and interior
sides on the lower part of the first joint with a small spine
in a minute tubercle. The first joint large, broader than the fourth with
•: bene; the second joint very short and triangular, serrated on the
movable lobe sharp and curved (*Tig. 11*), finely serrated
ly.
Cephalothorax granulated all over; spine between lateral angles
fossil, not ridged.
First abdominal segment below smooth, not

believed with five very distinct spines on the front edge and two spines below; third joint a spine
below; fourth joint long and a short, bluntly-
triangular apophyses on the interior-front; fifth joint
interiorly
and with a few teeth on the outside; fifth joint weak and narrow
fixed finger triangular, sharply pointed and serrated on both edges,
movable finger broadly curved and serrated within.

the first abdominal segment below smooth, anterior portion

in the neighbourhood of Montserrat in the West Indies, where
common.

THELPHONUS BIHOAMI, n. sp.

black; cephalothorax deep black; abdomen
black

io mal

the cheliceres strongly

others coral-red ; cephalo thorax and abdomen dark brown
 three joints of all the legs olive-green
 • below, the cephalo thorax and abdomen
 ■ *re* sparingly granulated and
 over I joint with
 : mid two small spinous
 h one spine below
 a blunt spine below and a long cylindrical
 -ral corner, slightly
 small, the fixed
 ? rratpd on the outer, the
 one gently curved and
 Cephalo minutely and densely granulated, the
 id frontal eyes barely tumid, at lower abdominal
 segment entire, elevated and pro.:

second joint with
 u on the anterior edge and four
 the i edge ; apophyses on the
 large (Uo outer; the
 if the is much narrower than the fourth but the two fingers are the
 size as in *cf* male. This is much shorter and broader than
 the same one in the male and I os are
 sh

stout
 thorax exactly as in the male.
 abdominal segments, and as in *t*
 male.

The males and females
 differ only with regard to the c-omen
 the only point of distinction lies in the

T! very ai
 Tavoy river in *Br*. It is a *j* wood
 by a small ligament It is probably this species
 j and not- *T*.

I have much pleasure in naming this species a *T*.
 in, of the Forest Department of India, who has
 me

CW

India, Burma, and the Malay Peninsula.

17

THEI

MS, n. sp.

Ocephalothorax, cheli'

Macs

pan

*9 reddish-black,
three other

o tara;i

b, with the

is bright red; ; below, the first joint of chelioeros blackish with red ; sfcemmm ami base of legs red ; legs the superior surface ; abdomen reddish brown. the male in colour.

blackish-brown turning to pink on thorax and abdomen dark olive-brown

first pair of legs

blackish, with the

other pair

uniform pale red, except the

∴

reddish

blackish.

1*1 inch ; cheliceres of male

<\$. Second joint of cheliceres

exteriorly blackish, the anterior and lateral edges with a

few obsolete teeth, 4 in number, one spine below ; third joint granulated on the inner, and one blunt spine below ; fourth joint nearly smooth, merely with a few punctures, no spine below, apophysis long and cylindrical, constricted in rather swollen at the end with a tumid process on inner side : fifth joint large, nearly entirely smooth, fixed finger rather stout, serrated on the outer edge, smooth movable finger rather long, blackish throughout, the inner edge blackish and serrated.

Ocephalothorax, the space between the lateral and frontal eyes rather swollen, rest

lower abdominal

cheliceres more slender than in the male but similar to female

front and internal

9 below ; third joint with

∴ spine below

spine below and a triangular

apophysis

blackish the inner edge and

densely

blackish on the outer ; fifth joint narrow and feeble, fixed finger triangular on both edges, movable finger curved, sharply pointed

lower abdominal

blackish, sharply protruding posteriorly

in a blunt point.

is very common

in Burma being found

but

and bricks and in mud walls

D. K. Macdonald

of at that place. 3

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THELYPHONU8 RANGUNESSIB, n. Sp

Cephalothorax, cheliceres, and abdomen d ok ; COXCB an
 ■emora of all the legs reddish bi'own, ■:' legs de*
 beneath, the eheliceres dark reddish-blank ; sternum ;ind legs deep n
 abdomen deep reddish-brov.

9 . Of precisely the so our as the
 \wmal. Clielicerea deep ling to red at
 the tips; cephalothoras an i
 of
 till the legs and the tibial j the flr ;ive-gr.
 remainder of 3 le red.

Length 1 ini t5 in the in&l
 Sti Second joint of ch« 1, with
 a few obsolete i >n the front, spines
 below, of which one < upper
 corner wrinkled ; third joint rather closely ,y upper
 and

^r sides, granulated wttl th one tooth be '
 joint
 nearly smooth, vei*y broad, no spine below, a| Hn-
 drical, and of nearly equal width thvoii. slightly wider near
 the

extreme tip; fifth joint large, nearly 'gnlar,
 serrated on both edges, movable finger cur
 rated within.

Cephalothorax densely granulated all c
 lateral and frontal eyes slightly prominent and oh
 First lower abdominal segment entire, with xrgin posteriorly
 nded.

Structure, Cheliceres short; secend j . two
 spines
 low and five sharp, distinct o a front edges, spar-
 ingly punctured all ■ aot wrinkled; joint igly
 punctured all over with. fotirth joint with
 a fev» punctures, q spi; with a
 few

large teeth ou the inner Lfth
 joint sparingly punctured and serrated ou the inner edge, iixed
 finger
 triangular and serrated on I iges, n r short
 and
 curved and serrated within.

Cephalothorax as in the male.

First abdominal segment below sharply produced posteriorly^
This species is very common in itang le district
round, being found under old timber, Ics.

11. THELYPHOHCH SYLVATI'

<?■

-hy black

ten duj

din?

la.

pair

vei

id.

?. The adult female is uukii about doubt, I found to have the same coloration as the male in respect to the 1

• b oeres pinkish brown; cephalothorax and abdomen dull blackish ; coxie and femora of all the legs deep olive, tht other parts of the legs pale rufou

Length 9 inch ; chelic- L inch.

Chelicere* very slightly punctured, nearly amoot cond joint wrinkled on the exterior Xi'oiir with a few obsoletei the front and interior edges, in number, one spii it without *ny spini joint broad with no tinct i- iarrow and cylin- drical, suddenly v, s i n o double the width on tin tin*

>cess on tl

y large, greatly aiuuate lie interior edge, fixed finger triangular, smooth on the inner edge, serrated on the outer ; movable finger ly curved, and pointed the ini . e.

The cephalothorax ia de granulated aud the first abdom segment entire a? ided posteriorly.

Tin unmarkable tor the colour of its legs is uo doubt com: a the >waddy District of Burma, but I only pro- cart ale and an immature animal of it, the former at ! and the latter at Miuhla. They were found in foreat.

U.

■ 1. Apophysis of the fourt; <f the cheli'

rat lower

*.

?■

at

>W of T.

-f.

HI.—Notes ■

CERA, No. 5.

By E. T. ATKT [Received, May 18th
;—Sead June 6th, 1888

Subfamily, ACANT »A, St51\

Oefvera. K. Y.-A. FOrli. (3), p. 32, 39 (1872): En. Hew,
v
Acanthosomi - Hem. Afrie., i, p. S3, 219 (1864).

o, b, c, as in Subfam. *Pentatomina* (J. A. S. B., |
1887).

'.) Tarsi 2-jointed : scuMlum not reaching the mid
dm-sum of the abdomen, generally very narrow p,t th- nd fur
nished with frona extended almost to tho B <uuded,
i ns those genera of the fani of
Dallas which have the ■ scntellum trifi
mch longer than broad, not reaching or barely extendiML; b tho
liddle of the dorsum of the abdomen, the apical par id behind
the
frona, generally small, short, and narrow tended
for a distance towards the apex of tli' ug only
the middle of the scutellum, apical margit oriam rarely
rounded towards the exterior apical <utided,
and the sixth ventral Begment, in 9, rath siuua:
apex in the middle before tho g

Genus MICRODKUTERTJS Dall;

Lie . i, p. 299 (1851) j Walker, C era.
K. V.-A. F6rh., p. 640 (1870): Ka. Hum., Herr. Schaff, Wan/., Ins., viii, p. 5
(1848).

Body elongate-ov: bead L radua!
uuately
narrowed behind the middle irallel or bar. erg-.
apes broadly and obtusely round |Ual ^n
length i antennee 5-join tod, ba?
heyond the apex of the he:.
nearly as long as the two following taken toge-
the fifth ; rostrum rather long, reaching ti of the v spine ;
2 end 3 joints about equal, thi sal joint 1: mcealed
within the head : pronotum a distinctly margined,
margins narrowly elevated and ftmooth, unan utn re
small, longer than broad; frena not extending beyond the

middle the aoutellum : membrane with longitudinal vein reaching the head : sixth ventral segment

es at the anterior margin, with a small cavity or hollow;
pect

z. ridge, which is elevated anteriorly, and cut
off

ly at its posterior extremity to make room for the ventral
spine scarcely passing the posterior coxie.

5. MICRODEUTEEUS MEnACEPHALUii, He IT. Schaff.

SoUaff., Wanz. Ins.j viii, p. 5, fc. 251, i.

783 (1848), \$.

Mi

tefvers. K. V.-A. Fiirh., p. 640 (1670) ; En.

Hem., v, p. 112(187

. ochreous-yellow ; finely, impressly pnnctured :
tollnm red-brown, the ba^e with four yellow spots
) : the proiioium somewhat red-brown towards the

'margin and ii. on the posterior part of segme
the cannexivum aud ita posterior prolongation, brown with a
violet

int: beneath unicolorqus : rostrum reaching the end of the
second

ii ventral sejr ontral spino extending AS far as the base of
the

first pair of feet i). SMI notes that the rostrum, at le
the Ues somewhat t iex of the third ventral se.

the venter ian rfdge is continued up to the apex of the sixth
segmeii he middle, is.a Httle shorter than the three preced-
ing tak ;md somewhat obtuse-angularly emarginate at the

apex: low- of the genital segment clothed with long,
dense

hairs, lateral 1 enminate. Long, 12 mill,
ported from Bengal, Calcutta, Sikkim (mini).

DALLABI, ii. sp.

cepJialuj, Dallas (m

SohAff?), List HemM ii, p.

30<'

Jff. 4fIS5i leer, Ca-

■ (1867): Stil, Oefrora, K. V.-A.

Forh.,

76).

the conneiivnm poster longations of
fc are much less produced.

A, Curtis.

Cat. Het, ii, p. 392
39

Walker,
V'-A. FSrh., p. 368 } p.

f18T

ii, p- 61 (1870); r, [» 110, 113 (1876): Distant, Bio!
Cimtr. Am.

lhyn,t p. 100 (1879J.

Head $j > \frac{1}{2}$ ^{tllofTUect*} **small** ^demte, Hat, triangular,
gradually
narrowed, narrow at. the apex, with the tyls longitudinally impressed ;

Shyncl

m. l .umarginate, process of the lateral turning forwards, short, triangular, somewhat depressed narrow at the apex, frena extended for a distal apical margin of corium extending beyond the apex posteriorly, abruptly hind wards between fchj the anterior margin of the mesoetethim, more or less distinct!; at the apex : apical angles of the sixth abdo. segment in rf at the ape

207. ACANTHOSOMA PBOXiMA, Dallas.

mimtm,
lias, List Hem., i, p. 303 (1851). W.-I!
mo, St&l, Kn. Hem., v, n 113 flK7^
yarkand Miss., p. 7 (1879).

Above brownish or yellowish green : very like A. / iinn., the lateral angles of the pronotum are punctured black: apex of scutellum, black.

Reported from Murree (Panjab) : Rawal Pindi (mihi).

298. ACANTHOSOMA DISTINCTA, Dallas.

isnSST *di3tinEtWth DaUa8> Li8tHera.i'* P-304(1851j; Walfa

Acanthoso a, Scott, A. M. N. H. f4 6 1
v, p. li ■): Renter, Berlin Ent. Zeitachr
rons. Ent. S. 115(1883).

Above pale olive-green, rather thickly punctured with black: head pointed front, finely punctured: pronotum with a transverse

impunctate space towards the anterior margin; lateral angles punctate, spinose, obtuse, ferruginous: scutellum brownish black: antennae towards the apex with the apical angles black.

Antennae orange with a black band at the first segment: body beneath pale testaceous: abdomen with the emargination of the apical segment very deep reaching the middle of the abdomen: margins spotted with black: legs pale greenish, with black spots on the tarsi fulvous: antennae rather long, pale greenish, with the two first joints dusky ferruginous (Dallas). Lonj

Reported from N. & India, Murree (Panjab), Darjiling, Japan,

299. **ACASTHOSHA**

tut difficile, Dallas, *hist* I (1851) j Walker, *Tat. Heb.**
9 (1867) : 3t>1, *En. Hem.*, v, p. 113 (1876).

Pale olive-green, tinted red and orange, pu 1: he;
dish ; jnga wrinkled and with a few black punctures : pronotura

rather

•kJy puuetured, black; anteriori¹ and lateral margins reddish, **lat**
i prominent, deep red: scutellum deep orange, with nun,
ack punctures, if corium thickly and **ra**
puactorei margin orange, rather strongly punctured bl
transparent, nearly colourless: **margins** of abdomen
eatb dark orange: abdomen **with ti** **il** sfigm
-inafce: **legs ferragio**

three basal joints somewhat ferruginous (V Long,
13—11

mill.

Locality unknown.

300. **ACANTHOSOMA DUBIA**, Dallas.

. Dallas, *List Hem.*, \, p, » 389
(1867) : Stal, *Kn. Uem.*, v, p. 118 (1876).

Closely allied to and hardly disL **rom t!** **ing**
li^ere in **having the** head anteriorly somewhat rou
notum less prouinulous, rounded: **third** joint **»»ro-**
the apex (**BaUas**), Long, 13—14 mill. **nniB black at**

by unknov.

101. **ACAHTHOSOMA ItABVICORNIS**, Dallas.

AcaiUh, *e*, Dallas, *List Horn.*, i, p. 311 (1851) ! \ fat. Hpt.
p. 399 (1867).

9. Above pale yellowish-olive: head
t
with the mg the juga, the sttt ■
ironotum thickty and **rather** coarsely punctured ; lateral **angles**
pro-long, iinpunctate horns which are **sometimea yellow**, horns
lirected forwards and of the samn thickIHSSS from **the** base to near I
a acute and slightly recurved: scutel **rongly**
rat not very thickly punctured; hemelytra very thickly
pimctur
lembi-ane transparent, brownish: body beneatl uale olive:
abdomen impunctate, but very finely wrinkled towards the sides; apex
mietimes bright red: legs and rostrnni i >xx& or pale
alive:
itenra testaceous, with the third joint black, e the bas«

J, long, 15—16; 9, 21 mill.
Locality unknown.

302. A

B.

ACA

, ; Wall:

p. 394 (1867); St&f, En. -l., p. 7 (1879).

. Elongate, above pale olive-green, rather finely and

s<

punctured black : head pale, with a few fine

; what pointed, with the tylus yeabine

pronotum with the lateral angles prominent; forming a short, obtuse spine on each side; two yellowish impunctate patches anterior margin, the lateral one with the disc reddish brown, with a yellowish, impunctate

brance transparent, brownish. Body beneath, pale greyish with red: abdomen impunctate, obtusely ridged in the middle; segments greatly developed, the lateral pit into two curved. 3rd segment of a bright orange colour, bearing a small brush of hairs at their apices, and nearly as long as the abdomen: the internal pit black: at the tip: prostethium densely and finely punctate. Legs yellowish-green, with the tips of the claws black. Extreme tip pitchy black: antennae pale yellow towards the end.

Reported from N. In<l

8. Ac

Acanthosoma elongatum, Dallas, List Hem., i, p. 309 (1853); Walker, C i, p. 394 (1867); St&l, En. Item., v, p. 115 (1876),

9. Elongate, above yellowish-green, punctured with black: head

finely rugose, impunctate, somewhat pointed in front. with the tylus longer than the juga: eyes black: pronotum yellowish reddish behind, in front and rather thickly punctured with black

the exception of a transverse band near the anterior margin; lateral angles produced into strong, deep crimson spines, with the apex obtuse: antennae coarsely but sparingly punctured black, and with

anterior brown, triangular mark in the middle. On the portion of the humerallytra reddish internally, the outer margin the greater portion of the apex, yellowish-green surface finely and strongly punctured with black and somewhat rugose: membrane

brownish transparent: body beneath, bright yellow, shining: abdomen

impunctate, with a strong median ridge. Sexual organs much developed

but much less so than in *A. forfex* ; lateral processes bright
flat, yellow, widened, emarginate at the tip which is black : process

•_k punctures; post margin of the nici mm
rostrn ii }
the remainder bro

Cndia.

OSOMA (?) BINOTATA, Walker.

Cat. Hot., ii, p. 395 (18G7).

tured; punctures brown

o last k •. antei;;

of the b r in

ing a little in front of the Load :

smooth eh the fore border Is a curved palo i
ies and . pale testaceous ; bind angle.-
pines r Kcutelluin TVLUI a -te
of wlil I

e coxte: be i cloui
ofe on the disfi ,—7

mill. a froTii

ral, fchixi 1 y and ro ugh lj

'nan hall engih
mdiag a little beyond the front of the head ;
arth a little shorter thi

■jcfcoral r Lt, acute, very slightly reei. [ag]
slightly much developed: abdomi eatb

! rather si-ill. i, Murr

A

POTIS, broad, nearly o\ 'ghly pnucturert
smooth ; fcylns
to the last coxae ; tij

as long as the third : pronotum with &
a slender paler atri]-

otly diverging horn 3 ; pecto-
"bem- nooth, slisrhtl. int- extotii
coxae : legs rather slender : membrane cinereous (*Walker,*
mill.

Exported from India.

VIJTOSOMA (?) Walker,

Acanthosoma edclish testaceous, elongate-oval

R : head elongate, trian.L itlackish 0 ig
the sides

which -Idish and slightly elevated: e;.

1 j, tore tlian half the length of the body; first joint yonc
the front of tho head ; second longer than 1
th a Httlo longer than I

: than the fourth; pronotam with two st'
uwards their tips and aro nearly as *h*

the pronotum: scuiellum wil
towftvds the base ;ge deep: ventro
nmediate come; legs testaceous, s^ . membrane p
1 blackish stripe (li null.

Reported from J

. ACASTI; Wi

Acanthosoma alaticor ,er, Cat.

elongate-f

ics reflux. es piccou, no

the last cox se ; tip black : an term

;ond joints testaeoi

;ig as the third; fourth longer than the thii U shorti

i.an the fourth,: proDotxtm pale tesfcaceous alo:

ceous band between tho horns W3J as tl

to breadth and B .id aud liuear from tho base to near

ban

t)domert ferruginous, pule ous ul

■Ac iesi

itio

"is:

: legs r, pale i : hetnelycra

d border, and wi

i onds to the costa; nicioib.

'>jr).

ill.

ia.

id tin" i

I slightly ■■-

id tinely striated ;

»ue, not pron

strum extent

ick, si

imcl

second

ding much bt. the front of the i

tirtli longer than the s.

jCOud u li

proiiotni

'3verso callus on ea

intermediate brendtli,

tly

rd, taj

he base to the tips, which

led; acufcellitn v -, 'htly ridged, less than half the

the abdomen, m fceuatod at the tip, wL L'ounde -tor

deep, extending to the head: abdomen black La the

tip

ventral .spine extends the middle coxse :

hemelytiti with a brown costal at] hi eh widens i

..; brane brown : wiugs brownish, ciuereos (*Walker*).

Long

m India.

irv.

i', p. 038 (1S70J i 10,

113.

Pronotini ly levigate ; within the levigate and more or I

£in with fewer punctures, which are pla

sometimes confused or here and ih iblo ; \ of the

■jly rounded, horizontal, not

turning

row -at the ay igles of sixth abd

or somoirhat acir

or but very slightly, extc

son-

ior

" « ■ ■ -

Reported frOm MadfflS| ,

lluo I

35

41

^

*

■

T. At

cell

I. joint umc!

■lotum i

ceral angles of pronot
 pices subacute, and very s.
 L*S ochraceous ;, apex of rostrum j Long,
 I mill. •Sikkini
 (tuihi).

RUFISITNA, Distant.

•ana. Ent. Son., 1857).

irk ochraceotis, angles purplish red : h
 \j wrinkled, apical part of tylus fo
 irn somewhat spar
 angles of tho pronotum produced in oi
 membrane pale hyaline, blackish at thy base : I
 very pttlo oehificeo ; a little darker in hm ix of tl
 pit&hy, reaching second abdominal segment; last
 abdominal
 •■uent v\ imall bl ota at the apex : pronotal spin
 og, 17 : exp. angl, ,11 mill.

SASTIAGALA MUSTELINA, Distant.

Soo., p. S52 (1S87J.

Bu -vo ochraceous; membrane p rownisfaj co um
 ines bi .tntonnaj ochj-aceous, apio of
 • I joint bird joint much longer than the secoj
 Lrely transversely wrinkled, eyes pitchy notum,
 fccutctf: ■ iely punctate : la of the pronotum
 poini
 c of
 jn.j 11 mill.
 m).

'SiMi.A, Walker, syi

(1867).

>v&l_t roughly punctured: head **and** fore-part
 a reddiah tinge ; el extendii:
 tram extending a little beyon
 the length o&
 t of the head; second much si third:

ger (l

long directly

l>us sp*

ti: pectoral ri

bout:

liemelytra. black along \

irregularly c along the outer border; m»

along the outer border, including a white

costal

mill. from the

Panjab : B

tant.

Boo., p. 353 {188

iu*aecn:

iicoous, 3-4 j

shorter than i

irth : eye-

li-brown

ly pui

the lal

produc

rounded sj

slightly reflexed at the api

ly pur.

and lei

:

.iud logs ochrar

apex of

igl. pn

.ill.

R(

from

ia.

Genus ANAXASI

in. Hem.v, p. 110, 113 (18/G).

o long, rather prorai

,re

tn of the prostetbinm

al part before th<

margin promluul

tdually naiTOWed

process

of

of tb

lotum turning o

uud distioctly

, coufu:

tho sixth segment of I

p. 3!

Lsohr., xxv, j>. II (l

lluad dull o

pronotum with the. an:
coloured with black, find with <1, im]

red are directed a little forwards,
but *hn* mod i the *hnn:* ■ iau of those spines
; etured the apex smooth. Sentelln ions
olive, Lugly and irregularly pustc fcb black; the apex
hem thickly and rather testaceous:
I r margin, as far as the submarginal vein, olive; membra
brownish v beneath orange us yellowi
the j> ..'ins
pale
■ wish olive, with the base of tli>
■ ta-
?.*cou* a short, testaceous:). Lo]

-17 **mUL**

Reported from India, Darjiling (mili).

318. ANAXANDRA coKNtTTA, Dallas.

:s, Trans. Ent. 19, f. f,
(18»);

Het, u, Stil,

En. Hem., T, p. III (18"i

9. Above ol htly clouded ^with yellowiht!, rather tlickly
ial angles strongly
>cessoa being more darkly coloured than the rest of
he antero-lateral margins of the pronotum beneath are ish:
Bllum i /sinuated on each side, iiru 'ore the
pex\$ li tra. thickly **and** strongly punctate membrane brown is!
I .irticularly at the internal angles: joints of the antem
ous with the botly, the apex, and sometimes the whole of
-vie brownish, yellow, with the tibial utral **spine** long,
reaching as far as the base of tJio anterior

d\ With the pronotal processes dark olive green, rounded at
the
ipex, beneath flat, but not grooved: the m<- us-
o red, with broad -whitish margins: the body

tinge ■ s theaj

•u : ventral spine pale.

ronotal processes pitchy, very acute, the apex
recurv-je, Bfrongly cbannelled I

pitchy brown, darki ,
and palest on the outer miirgins and *idong* (

a—' I iota.

spine pal wn: pectus 1
transparent: head beneath brownish (Dallas)
breadth of pronotuc> ill.
Itoported from Sikkiui (mihi).

Ancueandra ? +1, En. Hem., v, p. 11*1 (lb".

9. Olivaceons-flavescent, sparingly j . above; thrc<
>f the antennae, lateral margins and longitudin: orly
abbreviated, posteriorly fissured) on the head, long]
pronotum before the middle, apical interior spot on tlr

I
of the connexivnm, basal band (posterior; auate) on the
do; gment, and a transverse line on the inesopleu
cent Bpot he scntelluni, t rly and pOBte wit
ck; exi uiargin of in roⁱ
ral angles 0 pronotum produced in a very Ion[^]
ingly punctured, smooth towards the apex, acuminate ai*
recurved at the apex: dorsum of a.bclomeii aeons: in
-Hghtly infusc-ate, exterior margin

Peons: wings infuscato (Std). Body long, 17; breadth of pro
ce[^] ill-

Reported from India, Darjili i hi).
Inform and punctuation very Hke A. cornuta, I as:
prono

320. A ;DRA SI ;eeses long'
Anaxan< Tlata, Stal, !: i. v, p. 114 (IfiT L urning less upwards.

Closely allied to A.
processes sho» >ove bl
rounded, membrane more obscure, »r lim ,loat

■',<
margins of .colourous, and pronotm
tudinal line ; spot on the scute HUTU at tho ver.
a sparingly punctured (Std). Long, 13 : bra
10 mill, ported from Ind

321. AzUSvAHDRA HIO] fUTA,
nigrocoT

8J ularly, and hemelytra n
i of tl J, and t

t joint fc ; auteri<
arda the angles, I
;m afc the claval suture, ferrugi. I angles uf
ng bor
pane rtata at the
; this hoi M Ion -
membra cy wit!
the ert< jin : dorsum of abdon
lobes,

l i a beiu
 ,Jy fla¹
 tared, anterior
am Homewhat sine'
rounded: venter slightly rufesoout, apical an f the segments
of

um, narrowly black : do; , obli.r.jueTy
u before the ' fraptly strongly oblique, si i
o (*Rvi*: Long¹, ill.
pprted

ricH* lateral ir
ian narrow lougitudin
 ■ ti the the pronotnm, aad
tie *mm* 4 before the apex), blai
bennoe oehraeeous: |
.igles produced into long, sligl 3 spin
 ■Hum lutec
i coa;
jbraiie brown : body I
m with an oblique black Hue on Ldo. <
i differs in the smaller expanse of the pronotal
Long, 15 ; exp. angl. pron, 14 mill.
Hi ;kim.

it,
fane. E.
bright castaneous I, an

vcrsely wrinkled and with a few *O*.
an : -ily ochraceous : pronotiu
 con rior mar;;
 pro v-ards and forwards iut« i
 y reflexed hindwaj spines are
 punctate for about half bhi n sparing
 punctate: corium thickly par abdominal spines above
 beneath (ous, bnt vardly niargi: :
 bodj
 ■^aih and legs ochraccous (*I*¹ Long, 15; exp. angl. pron.

ed from Khasiya Hills (Assart

ANAXANDRA.

,
Kent-

Anaxandra hamatot Heater, Berlin. Ent. Zoifcschr., s.xv, p. 73 (1881).

Very like *A. rufescen* dlas, differs however in the lateral
 proaottim, also (In <?) in ai
 .ig a little ; ictly c
 tly in the structnro oi." S.
 bout one-third shorter than j
 I . Lent unco iithe i a. the middle,
 ■. o small bands snbv in the
 bnt densely ful le prodtced
 incurved hora, this horn furni the . ifch a
 pik> terior margin *an lou*
 ceding segment, inferior margin & *s lony*
tyli briefly biramoso at the ape.v arrow
 uminate, apex somewhat curv
 tse, abruptly dei: contracted at the apex (i . Loi
 ill.
 n Darjiling.

325. INDRA CO5IPACTA, Distant.

Anaxandra con Mist., Trans. En "l.

llody abova ochraccous, with
 . a spot be rid the mai
);, two circular oil' lines
 iiui, and a ' i round
 ecuteUum, black : angles of the pronotum, CD JUS : both proaol

on—.

beneath o<- me, nw
■). Lo ron., J^c
ported fro

Hahn

. ii, p.

p. 39

., p. 315 (18'

Antoi

two-thirds of

tie head

m, tho

joint stont and almost as long as the *third* ; tho **aeo**

tho third somewhat shorter thn,*) the

whicl

out as tho **r**

cori

she inner *IT-*

jllulc-liko voiii em

aparatively long and sle

mcaostoth in **L ri**

■ bet we

prnoi

furrow

iii \$,

lateral

Lfcer, Cat. V

6).

and . I

pale

black: **bead**

ius In:

strongly punctured \

the lat>

!

•m. N. I

OSIS i

mrsoly punctured:

coaa:

a lit: -.3: margins
of the ab
tea of eaoli segment

■usnt. afa the posterior in :

tx'<

iiotarc-

ml rid

i

'ho tw

oill.
Reporte

lia.

.

Saturated < li eome fi
scatchim a; tra stroi
uf th« am b to tho tt

b behi
angles, impu

tosety **pro** outwa ih a d
. **aite** acuto ; membrane .

fascescL^rit: abdomen unicoloro;

ith t-v

■ in til*

nco

very I
i almost two row
exterior margin of i ,
behind

tluum
higher

Is the -pariugly, pro
srnal plate much

pical mur-
the In

ermediate coxre, apex almost estend-
truncate, i

lino reaching :ntral

ibal lol : .

at

• us to entire interior margin t). Long, 0£;
with

ill.
from

Cmrocouia ECDXELI.ATA, Distant.

Dist., Ti'jtua, Enfc. Soc., p. 355 (IK

Body above ochraceous, thickly and eoars ^ nines of
rosy red: scutellum with a bl md

■in. aba: middle: ar oehmccous:

urn siraigtly producod

ad the postoi

o somewhat e 1: xuGinbranc pale 1 . with refl
the red upper surface of the abdomcu:

oarsely puctua I. Loag,

>voi

II.

tarn Naga II ii

K CLTNOCOB I Distant.

ulata) Dist., Trans. Eut. Soc 1887).

Body aboVe black och; and scutollntD coarsely but

Lte, eorium y pun am

teous spot on the disc of tl

irk-brownish and fche corium is bin

■ than the prouotutn or

produced into ioh the apices are sui

and prominently reflexed, and their posterior margins sinuated: membrane very pale ochraceous, pitchy towards the apex: body beneath apparently ochraceous (*Dist.*). Long, 8; exp. angl. pron. 6 mill.

Reported from N. E. Ind.

La.

Subfamily UROSTYGINA, Dallas.

Urostelida. Dallas, Trans. Ent. Soc., n. s. ii, p. 15. (*Dist.*) East Hem., i, p. 313

L852)j :

(18"

Ante: ^ed, basal

enclosed in a groove: head

small,

-: not trench: .ntennij'.

.roduced: odoriferous orifices Rpinoso: **poc tua** not

it.

tho antenna ■ aa loi;

joint

mnch han the head and pronotum; an^f —J

ug:—3.

Genus U;

Ilfct. ii, p. 410p

mall, short, b>

iiptly narrowed, j

; jiiga and tylue prodat

the juga; ey<

each other . k of the head ; antenr

a **ted**, inserted in a tubercle which i

■yes; first joint stoui

L» as **fcl**

itiin-ner at the base; uecoii'

'i tho second ; I

with G

so to the

. nclosed in a

small groov.

flat above, &

much narrowed

sou—JN

■!y nan

nearlj

ill the

aouto. Hemelj

the coriacco¹

its outer **margii**

)

od. line at the **ba**

o length of the eoriurn, where it emits a **branch** on its innoi

eg the baso of **the** membrane, an< ng¹ into i

running **singly** for a **short distance**, to five veins <

vo **inner and the fcwo outer**

jinitcd at

efore j

■ tho common trunk

ane

jhes beyond the apex of tho abdomen, and has six volns, of

which

<ort, placed at th

l angle

on con

h, tho margins

'ing a lit Ho beyond

b side: th<

claw-' '

■h project nearly as far as the | **Lor** angles o*^r

rment of Uio abdomen, **with** their points turned outwai . small

base of these **which 1;**

lly co.

and .within

the apex of a sc

Lch- is]

ly the **margin** of the dorsal port;

clothed **with** Ion.

t-h nearly fill tho

: iu the 9) **the** vulva r **plates are** not remarks i

mesostethium broa a cons

he anterior and tho intermediate feet;

on

the metastethrn

terior margin and near the

intc

line **direel**

perforated on their **posterio**

idently formi the **pro** I margins

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rong a]

rader, the posterior

ibout <, second minute (*J*

■wd in

U^restw., by its stoat antennae of

which

first joint is not macli longer thrui the head.

Unocnr'

III. A' J. A I UIS.
A,

c. (n, a.] . 2, f. 1

. p. 115

Body

-tc, ahovt

• grejr, fuelj

red: pronotum narrowly marg

banan

a the diso, of tho si

■ rthe lateral

'i with

• w HUP, co -

a, a spot oi-

™, with]

Pale!

0,1, ,

to Like! Ul. S U Ion ■! rows, bla, I*»-Us
ate D,, r^;
"if*...,,;
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of ve: , The
 3 emitting¹ a pi ig upwards, actu
 what lo oad at the base. Lorn.
 -lied from ti ceding by being somewhat
 dorsal punctuation strong bout the ventral sp aigcd
 or the 1 i line on the pronotuin and seutellnm : lai
 proaotum am obtusely rouded, prominent, not sinuated in
 Lbe
 middh
 Rej iliug.

UXACVLKTA,

p. 313 (1831* j Walk' J, Ca

itk black : head with two black st on the
 ver-
 tura with the lateral margins considerably waved : <
 whitish, finely punctured with brown and with iunieront,
 coarse black punctures; the middle of fche disc with a large brow
 mei brown margins of the abdomen
 davk
 ellow Hi Lures : ms :
 abdo ttly wrinkled i ly
 and
 ly and i with black; the sides somewhai
 metnred with black ; the of
 pectus rather thickly
 and
 find; ternum nearly impun
 y covered with fine black or brown points ;
 itfc brown: rostrum
 ilh t!i. pitchy : ante te baaii
 ish- b very minute black poi
 ■ k, with the base yellow (J Long,

"Rr >ra N. Ind

035. Ui

las, List Hem., i, p. 314 (IS5X); Walker, **Cat.**
 Flct p. 410 (Itti>7j; Stal, En. Hem., v, p. 116 (1676).

A.ljove brown, somewhat obse and fthely puue-

.-Idlo of th id tho apices of *the*
gins of the p ■'y edg w : scutellum
rather coarsely punctured with black, with the basal angles yeli
G

r>i

:k, wii bj m.

ack:).

bin ai

t

to the
black more
beyond* tl

of tli

four incomj

en with four

- poctus au,

J, **one** on **the** disc and one on *me*
m

slender (

mill

H I from **India**.

Bod

eons, shaded, and

■;:■£■,,

E. T.

m—J

ilbynci

43

■ body

*ous, spotted block

rostrum

■d froy:

bi, milii).

33:

■ FEERI

o brownish ochraceous, very thickly and cl s

on head, foscous: autenn

- short: pronotam

gina, navow' >ms: si

I flc

h>
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D'

eons : membrano'ff ■

•<3ous spoi

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nish

i'nscous lat(,

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vuua as a

^a br. •

.eoua, apicea of the

J. Lonj?, 12 mill,

from Assam.

onus Uco

wood.

15 (1837J: DaUas, List Hem., i, p. 313 (1851); E

iy long and slender, basal joint nearly

•rum taki

[pi'ODotni:

body]-

: ocelli present: mi ie with

: abdomen, in c?, simple, not armed with a for-

iii 9 , terminated by a true, co; . enrvd, recurved stylus,

339.

OH

ra PDNCTrci i \

Westwood.

fit, En. Hem., v, p.

(i); Oi:

(1870).

Ru

more or less tinted virescent;

jnotuui with two .

-k spots in the middle towards the

[or margin (s.

.out); hemelytra with a somewhat lar

nek spot in the

the corin<

'if the

mrth j«>iii ty beneath and soncolorous (

ody long, 10.j mill. gal, N> unimon in Sikkim (mihi), Calcu;

iii (1861
(187

Ethead impunctate, orang-e : t ;m, sci:
and hemi ..reen, rather thickly and finely (tared; m no
gemitransparent, brownis >dy bei i*s
pai 'si brownish : rostrtnn I
very *hmg* and slender ; basal joint orange j seen browrish, the two latter
-with the base greenish-white (*Dalian*), *hong*,

I from N. India, Sikkim (mini).

Dallas, ■
p. 4 , Eu. Hem., v, p. 117 (

9. bore pale greenish yellow I brown is)
punctured with brown, with the lateral <s waved:
scui-
ro strongly pnn* with brown than ti : cor:
>f the In :md finely pnnetun
outer portions of the apical margin black, the medi
mi ie transparent whitish, with a blao
angle: body beneath orang* lomen
the sides reddish n; finkled :
>d with blown points, which, towards fc]
side: rostrum y< *vith* the tip
bL
the renminder pale

—14 i
ted fri Sikkim (rath)

i.,

Ent 9. 0

eyes ; the apex oJ >bes and the
head, pate yellow; ej. , -own, ocelli reddish >us
*ai ■nteniia clothed with very small whitish hairs;
fche joint t r dusky U the apex
with -.
paler j rosfan ith the
extreme

—lfotes

.fhota.

with the anterior angles round
an ab).

n before the n

LTTOW and the anterior eleva;

beneath fct

with brown, and with a pale i

patch within each an

mgle: scute'

.t.hcr

thiokly* punctun

and i

;>ale

fulvous, smooth, impunctate, with *B* large dull, pale-brown
patch on

Legs clothed with fine whitish hairs: femora yellow.

with tine

Q points; tibiae an* dusky; ci.

cly and radius finely punct; tibia

i brown, with tibiae

pn

tion yellow

on the inner

aemittai

brownish: abdomen

above bright red

aug,

very *i*.

wrinkled *t*

:kiss line o

in the margin: ti

abdomen beneath with tibiae *

pala

wrinkled transversely, coxae

3, UR

. Walker.

I (1867J).

mt, Soieu.

■I: head very small: coxae between the first
coxae* and *i*

.coxae: at

almost as long as the pronotum, setae

iceous, a little more than *i*

pale *t*

ml, *fi*J

than the fourth: rmmotum with,

impression; sides very slightly reddish, abdo-

men; apical appendages; the upper segment lanceolate, armed

with two spines: membrane brownish cinereous

(Walker).

g, 1/2 mill. Reported from Silliat, Myanmar

(Marri).

344. TERNOSTYLUS PHILOB&BS, Walker

i, p. 41: a,

fusiform, very finely punctate

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-little looj
" "

,n each ride **ill.**

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o sina'

Beputed from BD 'atoll,

tL than the
■-Hi: **wiiiaslighi**
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Wa, at in front of

hr''fler; ' I fourth on fcl
sreous Lf

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■ ■ ntellum will, a .,.,

the apex very finely a
at the [turo

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apex of moml

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beneath, elongate, -

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a carin LVI lobes turning upwards (
i from Darjiling,

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' tlas, Ldsfc ETora., i. p.
813 (:

. Jk-n., v, p. 117

L842);—*Tffi*

ig: roi

the

. in ihe c?,verylonir

the body, 1-2-4-5 pints of equal length, th

a elongate; membmu- elvo

inct longitudinal veins: i ngate. abdomen.

e 9, termina

ilf the length of ' the abdomen or
no! w.

347. UROLABIDA GRAYII, White.

Calliprepas Grayii, White, Mag. N. H., iii, p. 543 (1839); Trans. Ent. Soc., iiii, p. 93 (1841—43).

Urolabida Grayii, Dallas, List Hem., i, p. 316 (1851); Trans. Ent. Soc. (n. s.) Hem., v, p. 117

415 (It

(18:

Vii oils: pronotum with two
sp< wo baaal spots, red : moml
basal i part wii a trai-

■i on a slig]

placed on the upp
■i the
g as the h>

no ocelli
i the first pair of legs, apparea . second joi
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RIOKICA, V-

T., Wans

i, Stal, Ea. Hem., v, p. 117 (187K).

afescent luteous, I ared; pronotam and hemelytra
tinted

spot il) a testaceous semicircle run;
of tin; corium in the middle; ani s » 'P pronotum te
lorous, foot j)

fusiform \y pui I;
 arly to the iuterraed- mtennte black
 of the i. joint reddish, as long
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 t the prouotum
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340. 1

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membrane brassy
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iiafcly wrinkled: pectus 1
den pnbesceuce, witl;

2 mill. ,

Borneo, Ch:

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lona; a

>us
<1 :

short, reaching somewhat the middle of the mesosternum, first joint posteriorly extending somewhat beyond the bucculae: pronotum rather produced posteriorly over the base of the scutellum which is somewhat produced at the apex, hardly covering the interior basal angle of the membrane; frena extended to a distance beyond the middle of the scutellum: the apical margin of the corium rounded towards the exterior apical angle: membrane with several areolae at the base, emitting longitudinal veins: prostethium anteriorly slightly dilated, sinuated behind the eyes, canaliculate in the middle: mesostethium with a robust ridge, furrowed behind the middle: metastethium much elevated, somewhat sinuated posteriorly, produced to a distance anteriorly, the produced part compressly narrowed forwards, extended to the first pair of coxae, touching the mesosternal ridge: second ventral segment elevated in the middle in an obtuse tubercle, and touching the base of the metastethium: feet robust, femora usually spinose beneath at the apex; tibiae furrowed above; tarsi 3-jointed (Stål).

356. TESSARATOMA NIGRIPES, Dallas.

Tessaratomia nigripes, Dallas, List Hem., i, p. 341 (1851); Walker, Cat. Het., iii, p. 461 (1868); Stål, Ofvers. K. V.-A. Förh., p. 642 (1870); En. Hem., i, p. 67 (1870).

Tessaratomia javanica, var. *nigripes*, Volk, Faun. Ent. Ind. Néerl. p. 26 (1868).

♀. Colour and form of *T. papillosa*, Drury: head with the margins narrowly edged black: lateral margins of pronotum rounded, broadly reflexed: apex of scutellum broad and rounded, hollowed above and black: abdomen above black, somewhat shining, finely wrinkled transversely, margins dark brown; beneath dull red, somewhat opaque, very thickly covered with minute confluent punctures, with the median ridge, the lateral margins and an irregular interrupted band on each side of each segment deep pitchy brown: pectus spotted black: sternal ridge deep chocolate brown: legs, rostrum and antennae, black (or deep brown), the last long and slender (Dallas). Long, 32-33 mill.

Reported from Java, Philippines, Sikkim (mihi).

357. TESSARATOMA MALAYA, Stål.

Tessaratomia malaya, Stål, En. Hem., i, p. 67 (1870); Distant, A. M. N. H. (5 s.), iii, p. 45 (1879).

♀. Ochraceous: antennae, extreme margin of head, rostrum, at least half of the apical part of the scutellum behind the frena, spots on the pectus at the coxae, and a large transverse lateral spot, also the feet, black or fuscous-piceous: dorsum of abdomen subsanguineous:

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Head small, yoIV i

black: pronotu]

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lar, terminating in a

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 llow: 1 j strum brown (J
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 § , Above entir I and prooiotam a
 1 abdomen a little ferruginous : lateral *i* , of proiio-
 tam almost i-ou* ior margin tiun. sfc straight: sternal
 widened, not e* md the base oJ r COXOB : abdo-
 litate on the si Lent wil p small angles, the t
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 Rupoi■: Tho Indian

->MA (?) FUR' Or.

■ anil scute¹ lam thickly *tint*¹. mi-
 sty and finely s I on each si
 ond joint a little longer than the
 ih< the sides pie Eorming two very much round
 - rounded : soutellum sligiitl
 baa a black for!-. pectus partly bh rrn-
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 : heinelytra
 i testaoeotts-i us.
 i in T. *jpopUioso*j Bides i.
 Long, 27j mill. n.

•: (1863.; E, p. 6

tat produced posteriorly,
 uui **triangular**, narrow at fch*

•aed. All
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SSI- 8IPHSU8 ALOIDES

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b^h, *remotely*

Reported from Cambodia.

OB, Stai

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niM-gm of abdomen ami i
in foar **rows**, suba,MOns f"BC fus \

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line extending on
.which is round-
triangular
tip: poctus tost:

the fore-border and with a black m
the fo nder, to the ;
tent: scutdlum darker than, the pronotum,
,\tly furrowed near
al ridge lanceolate, extending to fi
Lty concave, contiguous to the hroad,
beneath piceous, very thickly and finely
ddle p aigifcudinally and very minutely si
tl, acute, not extending so s
piceotig; femora tawny at

nn.3 IT.

mee a little longer than in the
;■ and i Ling the
iusevfcion of£ tho ini
terior au.
r margin slightly-rounded and aiuu-
>£ the scutelum : BternnJ ridge ex-
which b(at the in tier lion of it-
nd advances in tlie form of a recurved hoofe
feet: scni not re; tlio
p canaliculate or spoon-shaped: abdo^
larged on
but I at the end of the
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Stal, Eii. II.

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Ktf Erom /> aear the apex armed
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J68),

(1862); I. c, p.

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ora beneath with two spines **at** the

apex

(*St&l*). *Low*

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■, produced anteriorly

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LOJ in ■wliich the apex of the rostrum rep

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-; at **the bas< .**

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pronomi nctured black; l_{ntera}.

^{ve} **obscurely**

a spots: **antenna**,

S*«i horns, ratne:

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very **Badj** punctured
portion of the a purplish

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384). Ci\ AN'CtTLATA, **SUil**,
Trans. **Eat. Soc.**, (3 s.J i, p. 001 (1

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lie apex: last
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(1863)j VTL

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of the pronotum and the stroma: half of the pronotum and the corium are dull: r-

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iO rounded s. Long, 34 mill.

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386. Ail

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itence of equal length, tfai

somewhat flattened from the base forward

■*ou both side-r hat produce

quietly punctured than the 'im : I

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Reported from N. Ind

387. CARPONA AH

it. 1

■ P-Vi(I

ii, a little ligi

mas bla

trav

eyes light brown, ocelli yellow: pili m dilated, disc finely

punctured: scutellum distinctly v

hemelytra very finely punctulate, the margin obscure

and the reflexed margin of the hemelytra, yellowish;

itches on the lateral margins of

some abdominal

■ segments; the sixth segment is acuminate in both sexes, tho 4-G

9 : feet stout, with long spines on the

smora |

9 : feet stout, with long spines on the

9 : feet stout, with long spines on the

9 : feet stout, with long spines on the

ITDIU !

Genus PTCANUM, Am.

it. B .. 171 (1843): Dallas, List Hem '851}: Walker, p. 470 (1868); Stal .o (Iboij: Eu. Hem., i, .

Head rather pointed, anterior margin slightly emarginate : antennae

■ ely extendii an-

nlmoafe cii: ad

which is as long¹ as the fourth : ro

>£ the I pair i ;v onotum sci.nlai

posterior b ;ht and not pr

feral mar, k little reflexed : no

■ < t the base, but short, not n>acl

lie of tl tmen; its apex verj I, extended a litti

>rm of a Ion

tip spoon-sh abdomen oval, mar.

is, extending on each side a little

ie

ed ; feet moderate ; femora

»ent spines at the apex (Am.

338. PYOANUM RUBENS, Fabricius. Fabr Syat., ir, p. 107 (1794) : Stoll, PIUWUBCS, p. 21,

e, ObH. Ent., p. 115 (1801J.

|L803J.

. x, p. 591 (1823J.

rr. Schaff,

iihmcharU, Hist, li

Cinez rubi f. 25, 29 (1788).

Cinez am

Edessa ame

Edessa rubi

Tessaratom

Apongopus

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fiibua spotted fuscous, i

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femora brinj/

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 ;eneous-green; membrane cinereous Body
 .ill.
 from I appears to be intermediate between P. *pon-*
zros data, Still, (Siainj.

Pijcanh pAiLrPES, "Walker.
 iii, p. 473 (1SG3J).
 pale luteona beneai pionotiun and scutel-
 iry tbii punct
 that hue: eyes
 .fcenneo luteouaj second j vii
 , mu el i shorte
 rfch black, ye the base, a little sho
 ■ turn witl: teoua border, *trsa*
 tiatetl; fore part on each side much dilate* ally
 ell defined right a,ngle : Bc\;tolltw n transv. ru-
 >ve purple; connexivnra deep green, borderer
 ie lnteous ; iiemelytra blackish, irreg
 red 0 emerald green : * iugs blackish cinere-
 ous
 *m N. India. Walker notes that it appears to bo
 a
 link be twee:- i and *Dalcantha*, and is close to *I). stalii*, Voll.

aufi OXXLOBUS, Si
 tn., i, p. !
 ■: head small, gradually somewhat sinuately narrowed
 viotig, rounded at the apex ; ocelli twice
 from the te ol
 t longer than the second jstethinm LongitudJ .
 na not olevaf rally SJ
 of segment unions,
 ;t.l angles acute, prod need to a distance
 : feet moderate ,'
 r somewhat equal to femora in length:
 differs
 from / hape of the abdomen (*S'dl*).

of

J fioni TV

Genus

•

oad ; j

c

mo

!lnmai

prnotam edged brown
pointing towards

ie sides, on **th**
ial margin: i

tz-ansparont uatv

jellof-gn
is brow

;', firsv

ip

ill.

DiL

II, \ n.

testaceoub i td,

p!</.

uxte black,

tly longer than secou



3, t'oro

i aide:

heme I

femora I

e, 1

fem

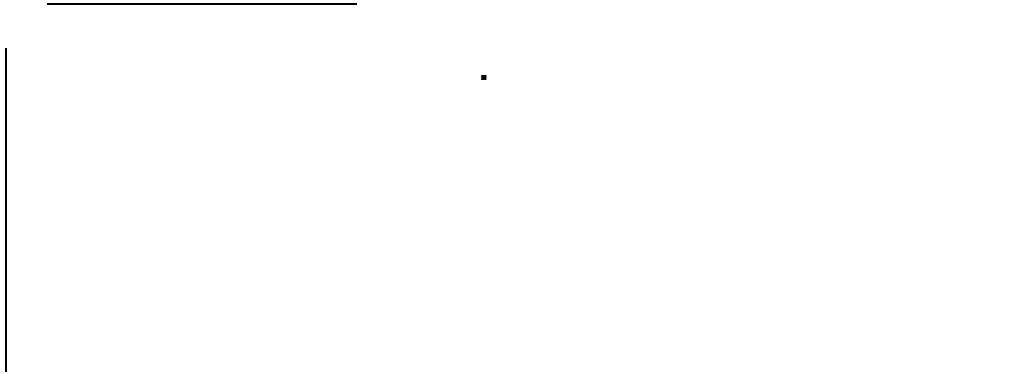
iluted

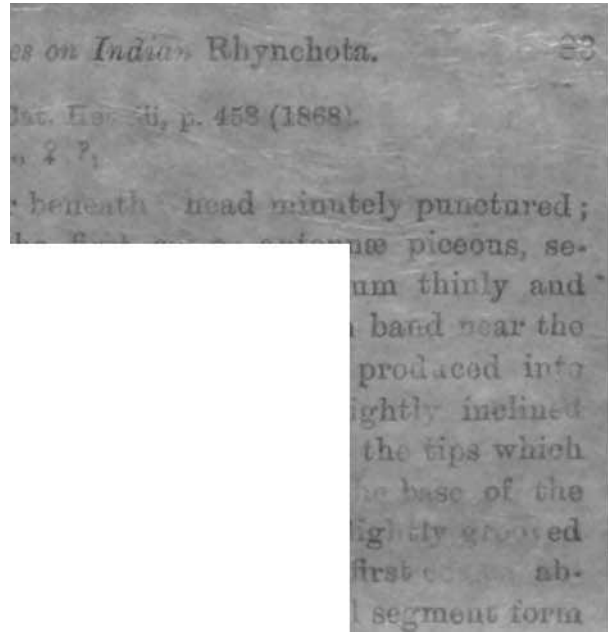
slender and ft

aem *tv*

! a

little U





r T
trn: in'

..

bam wi

tte-

S Will:

long, I

smaller, b

5J.

head mina

<ending a little

thinly and roughly pu
! e; ho: f,

with h:

; hind
; 'aoato, grouv

d town
j6 pair of coxw,
Lient of the abdomen
lagoa : "homel;

we
Lo<

, with
Bod ioug, J
)•

mem-

Body

tliiokly and rather rough¹
tn broa

head

.

i

id logs ot; me

'851): !'■
Subfam. 1 VA rJI. P.
bey cm'.
■1 par*

i(1851):

and
all,

fche third "\ -; a litr'
s the iiiSv if the middle pair
:lost Be mi circular n o
poafcerio: ...
scentolluin scarc(ig the middle of the abdo-
tex broad and hinu.t ely rounded : mem brain segular
med of orse a beyond
LO abdomen broad,
r< 1 extending

>t. Farj

BOIZ.In>..

, Faune.

iull

A, d

as:—**Fuse**

o-bord-loo

tbx

uitllum and on I

'her, sordid orange **varied bro**

Ti ties much in colour: eomel

L-niginous, beneath palor, sometimi

nd ventral *h*

tginous

Reported

Philippines, Ma>

.10.

11MAC1

8GS

p. SO {

Black-pun

turn, feri r spot at base of scutollum u

;j, sp¹ > submarginal streal!

m, feet and bore -ouaexivum, **red**

I 3-16 mill.

5. CYCLOP

ke (18CSJ : Sti

'5 B.) in, p. 45 (187^).

pui

some

black, Bom-- shining eerugin.....

haring onnexi .ucolorous, neither br

being more ol .

Himn

Long, 10-11 mill. I ha onfeirel

I am aii

being TEITO common in il<

A sout;

S(1861)

til, sui

jnjEra some-

im ext<

thf) iii'

lw: anteuafe 5-joiaited:

or al

**Hum : **

**'Liuongst tl , 'ent
the sea**

■\y

**mtire at the apes, rotinded, and m
tbo middlo.**

406. A

g.

;; Dis

168).
1. i, P- 83 (181
; Tonotuni,
<scurely oli 3: head and antt
k: gin of pro
iomen

;S: upj
t: tlorsum of
abd--ooas-fuscous at tbo apex
(

F. B ry; A: .
Itta.

408. Ai>
L4 (1776); Spec
215

Fabrici . RLyng., p. 151

7(184-1

Head deop black, inn
Leveted margin rd (lura b]
ra rnf o black
>ns: feet bla<

389.J

Atkinson—X-

3sam, (mihy, Tr. Bombay, K (railii), rum

409. A

isfew., Hoiio i m., i, p.
a. Hen>. 5 {1670J s Distant, « M.

Entirely lufceons -eons: pronohim and vrsely
e : antennra and leet fuseons : last joint oi pale ;
▶eneath concolovous I <"-18 mill,
.orted from 15

4tlO, As] JS stoc;FOLIOS, Westww

79).

■ ■ i., i.'p. ai7 (1851): Walker, Cat. Het.,

iii, '%

Obacnrely copper) very much punctured ; antonuis short,
; memb lateous-fulvon with
turn transversely subforeoiato; first

femoi'a

■ Lrh (I! Body !<■ 5 mill.

Bei> 'Hi, India, Gogo, N". Bengal, Assam.

£15, "W

J2 (1868 En. Heci 79).

AH iiscoTiS, above just tinted with very
cupreous, motni! with

b some . a
: 7-18 mill.

fcof the

and m
. 18-19 mill.

Soluj tnd that, Assam,

412.

West wo'

ias,

the in san gain eons,
raie k r and m
Reported from India, Ja-\

wood.

id, Hope, Oat. Hem., i, ;
r, Cat. Het.,

Closely allied to A.
variety of that species; colour more piceous, and luteous sides of the
abdomen by black dots; membrane with more are- at the base (*Weattf.**).
Long, 15^-16 mill.
Reported from Java.

414. As i

, Cat. Het., iii, |
(1870) j Distant, A. M. N. H. (5 a.), iii, p. 45 (1879).

Hied to but much longer than A. «i<
fuscous-piceous: membrane coneolorou Lt 12 \
are forked and areolated at the base : sides of the prunotum t
straight (oblique) ; last tibia* a little dilated "before the middle
(*Weslw.*). Long, 18-19 mill.

Reported from Kepdl, Silhat, AflBam, couunoi ,Q

415. A

:f>n(j&piis - licolor, Dalla«, 1/
p. 480 (IS'is) ; Stal, *En. Hem.*, i, p." 85 (1870).

\$. Closely resembles A **Pabr.**, entirely fnsov
the black antennue: body beneatli jjaler than I

II. Reported from 1

416. I
ASPONQOPUS

., Dallas, List Hi L851); Walkor, Cat, net.,
p. 483 (1868) : Stai, *En. Hem.*,

c?. Black piceous, B I and nm
very thici iakled



\ Atkinson—i

ota.

lebrano]

age, tl

of each segm<

o abdo

punctured beneal

b a bla<

on each of ti

: legs bla

QSB black with tL

orange; second joint much sb

e third (7

.I

from Tenasyt-rim.

ABPONI

, Walker,

tker, C.

p. 433 (18C8).

\y piiuctui-ed, bmasy-piceous

wny : ■

necond joint a

I; font

second; fifth

oa of pronotn

abdomi

• onotum and scutellum transversely and

. mcini

Lon.

L11. Allied to A

, Voll.,

(Java),

colour of the head and of the uuder-ai<

BO-ABSE!3, R

o.Mag. xvii

(1881).

^ronotum and Si

in densely an

■les of headdis

over half loi

a trial

tho

m scarcely re:'

on the pru

I.

Ger.

G

lousa before it: antennae 4

wed : ;

segment

a the

;us an

a Arc!

no turn ;

ia the middt

the abdominal segmen

ed po«

; promi unions befor

or obtuse lobule

ea on I .

yak : 2-3 joints of the
antouneo ampUfied on both sides.

Div. P

419. M.

if. (P

Ovate, oIJ

black:

antennte short, *QOUH*

m with ti

iorly acute:

urn and

hcmelytra

ob

sordidly whifclsb, i

Closely air

intenne joints together

longer than I

^ins bisinuate ; margin af abdomen somewhat d«.

mill.

sorted from China, A

11—;

JO, Mi

SRME, Herr. Sch

i ; Walk

i. 86(1870).

Westw..

v or mpro slender, the sp

fonotum <L*uti.

le, also the anglef

i fi-om Bengal, Assam, China,

Div.

Dallas, i h.

Ind'i

:

Wa«z. Tim., v,

303 (1839).

. 87 (187

n and coi'iwm, fuscous-purple : membrane

ed : aute;

black : body beneath

Fabi\, but very

m. which :

liefly in having the

notum prominulouB in a small tooth

id the setitelhun a little ami Ujud the lateral sinn

Le

Guilloi;

sinuate, dentate,
hong,

ubodia, P

India, 3i

!ip-

conv try thickly and minutely

punctured ;

ras bey on

-muled

BE 4,-

lilateti

E. I

rounded,]; than the .imont, pop.;
 'less than *h* bhe length <• n, rnuet
 ipex: ubdomt ical membrane cnt
 beneath : legs stout: tarsi 2->joint the first: hemelytra
 reaching the apex of *tW* dinal veins and with a few . in the
 structure of the pronotum, fche le,¹-membrane, the stouter body
 and the sides of the abdomen i.

422. Tn

;8).

Pu dingy oehraceous

a Luteo
 pectus with tliri
 abdomen above with lntaous spots aloii
 lyti
 (It . I

Reported froin Araboitia, Banna

Genus ATELIDER, Dull

A. M. N. H., (2 8,) x,
 StM, otrerB. K.

•iat ovj'

ly at the apex; ! small

■oad and a

her, fn
 blftd
 the ba .ttle lo
 3-4> r than the
 termed iai
 en two somowhii
 anterior uidfgiu <

ad rate, rather narrower in front ad,
lai

in short and broad, with the

jmon (waya)) with, thei

nearly circle ox above, very coi
t trnij iteml vnlv

tout, femora unarmed ; fcibii

amiell !i; unit

ior margin and occupy b

segmen i

the upper portion of whi

¹need : orioi

irregularly by a *ootl

the margin of the ring is

BATUS,

va, br-'ssy black, somewhat oi>
iral in-. tinged with chestm

■ middle ; ben uish fuh

brown; ocelli yellow : anc i

thickly clothed

a! joint fulvous

ulvovous

id wrinkl'

with a am uiinuovous with that on the
the h dull orange, wii

dges

ly and minutely punctured and trans-

»ly a smooth orange-yellow

rax : pectus brownish fulvous, sparingly punctui-ed, with
. black, rugose) I on each side within the

i: legs pale chuatnut brown: hemelytra bli . some-

bri -e; outer mar^iu y fulvovous,

a streak on tho d .ase of tht

itne brow tve blaci ome-

.y, finely granulo

b a longitudinal oi ,ous

n each.

:Iy gTi:

i side within the line of stigma; ar
plates edged wit It black mill.

m Silba^f. The in< oum has specimens fv

.m.

Add:—

ibf&m. PHVi , Stal.

i. (3), p. 32 (1872): i , p.
350 (IS5I) :—Vhy

(a) AsiuS-.

(6)—Rostrum phort-, not extended "behind i*b<
joints very sbon , or fc part,
bue d usually foliacoous or elongated ai
jug L to a di lore the ;
(aent hidden
the motasfcethium : eonee .!

nns Cl

:u., 5 -io'>

Jody oblong, ovate : head BID:

roft pex, aides less stroi
apex, not much longer than, the prominuIons
boyond the sides of the hoad: eyes n

ced very close to tho eyes : antenn ated, a
md pr •{joiar.

silted, j

joint long<

oris:
straight horns whici
are sc
margius i
along I tteral '

and size • *t* x tended beyond the middle of the *liana* : me:
 with longitudinal veins : legs stout, tibiae quadrangular with the
 \y on the anterior pair; tarsi 3-joint.

0-

VACIDA, D

i«fcHeiT!

i. 11, f. 3 (1851); W"

... ii

imal li

idl

Lelytra with some mora *ov let*

Ie of t!

ne hi*'

t numerous brown po

at the base and within the lafci :

abdomen beneath, thickly pnn>

with nun 3-5 segments each

¹: pectus brownish obscure vuh a largo
 ttch on each side of stebium: legs
 its: rostrum with th<

an;

vered

own points; lasfe joint brown

the base t<

). Long', 25 mill.

Beported fi-om Indi

.kim (mibi).

Genr

IRA, Am. & Ser

His: Sns. "E&n., p. 175 (JSi:-

a, pt., Dallas, List Horn., i,

p.

352, (1851); Wa

^09): StU, En.

v, p. 118,

119

Head

fcennss longer than

pro

am e;

of the anterior

fee'

£ the pronotum rounded, posterior mai'gin

traa-

cat*.

ht: set fellnm extending a little* beyond the middle

of the abdomen, siniafcetd on the side

inbrano almost as larg-e as the

i, nioiv

"Put, with rather regular longi-

li,

>rter than

iotnen which is rather

.Ie tumid beneath : feet tolerably robots

-hort, nearly equal

in

Sffth (A

im., v, i.
LLmdb. Eut., ii (i),

ll,

M, Kn. Hem., v, p. 119 -
filiform, black, first jo

small lines wl

am Ion;
>y trai.
it the
base-rth wj
pre [ongitu
I whit
3: abdomen above fuscous_T margin p;¹
beneath **brunneous**, with n row oi elevate
concoloroua, impressly puii iuscous, with two
ferruginous
, exteiit sidt >n.s, 3-joi
. 23 mill. ■om Chiuu, Bengal,
Assain (m

Genus BASICETPTDS, E

Wanz. IM., VII, p. 81 (18*4) 119 (1S76):—P
pt., Dallas, Us' I (1851); Walker, Cat. Hec_M iii, p, :

Dal *yflocephala*, 1.

. and JBa

India and near *i*

thus **difEei** —

>. Pectus -without a Ie near 1

2-5. Scntellum without a binuod B\

3-4. Costal margin ulesa antt orspn:

punctate :•—V

4-3. Oostai i of corium < • pale, levigate and •
sometimes marked by transverse Bpots oi one, or
arranged iu remote transverse rows;—*Sasicryptus*.

Co al Bbreak on scute Hum, uitramargimu bi
niiddi behind the middle, also entire costal liinbus, na-

ff.

L. Pi. ith a levigate latern ic fpos; abbre
w the ooxte ; the streak genera :—Go

fc of rostram is hidden between the oval lateral pieo
hoad beneath ; second joint free, shoi fth ;
ihing first coxse; tho fourth readies the middle of the
carinatt

■aura: membran Lly half tho size of the coriaceous portu
the home.

if. p. 119

(1876).

Jaga round' te apex, contisnioi ond the tylus: fir-
rostrum entirely hidden, second shortest, -3-1 equally long,
UILC 'id first pair of feet, fourth the middle of the iinely ridged
niesoatcthium.: membrane half as large as the coriaceous portion.

426. BASICRTFTUS ILLVJSIINATUS, Distant.

Vans. Ent. Soo., p. 358 (1SS7).

Body above dull diuk i t, pronotam with abroad,
rgiaed black, attenuated at each end -lightly
-3 dnll obraceotis; 1-3 joints of antenna i o
pronotam somewhat finely crenil:-
iced: si'iitellam with a small
iteous spot in each sal angle aud a few very small luteous
\-, and with some median aud lateral black pu
sral margin of corium narrowly luteous, and with sor.i mall
aud irregular aembrane
tbiokl. tuacon s: body beneath and

I

ih black pane disc oE sternum and som
:s to ab re lafceous: tarsal j o mo what oc'
;th (Di.<L). I I4j ex p. angl. pron., 10 mill.
Reported from N. Indi

landwards and reduced near the end of the tyl simple impression
where abut two other like impressions that mark tl

three lobes: labrum and rostral e the fey]
former is transversely striated and covers the whole and at
least half the second joint of the rostrum: head beneath convex; the
rostral canal does not re 3 base and receives the whole of the first

joint of the pronotum and part of the second joint; the rostrum does not
reach tl tho apex of its fourth joint rests on fl
prostothium between the first pair of f •

central : prostethiuni dat, sides
with

margin: mesostethium flat uncealing the middle of the
first segment: the second segment without spine or protuberance, venter
/ex and even somewhat;

> dilated ;
; a extending

ing one-third of the hex I varial
Differs from I) Am. & Serv., in ha\ feral streak con-

tinued v li the scutellum, intramarginal before, the , marginal
: middle, also costal limb. entirely

Walter. 427.
3).

Jn. Hem.) v, p. 120 (1876),
Tawny, very thickly and mini)y

clouded
blackish beneath: head a little lo

contiguous, except livid, i ueeolate
tending to the first co.: -tenure black i ex-

than thi L: pronotum between the hi fcb. a trai

ridge and an anterior slight metallic-green transverse frnt
abbreviai each end; space between the v" d the

mostly piceous; hind angles acute, prominent: scat
at the tip, with two tet» ta stripes which are with i

green on the otitex- : logs
cobiti tustae- with many black

Body long, 17-18 mill.
Reported from Burma.

Genns GONOPSIS, Amyot &
Hist. Nat. Ins. Hem., p. 120 (1843) : S tal, I , p. 121 (IS

AH : arhjnchu>s, Lap.: hea^ rior

pronotum i n a pointed ep ab-

Totes

jiudrt, in c?, almost
»te (*An*)

Wtly truncate; in S¹

-'gi-

3.
Go

ist., Trans. **Bnfe.** Soo., p. 339 [1883

Body above some whit obse:
lisfa, t' joint shorter than second or
longest and pilose; lateral margins of tke pronotrm finely crenulate, the
Into short snbac inoa between v.
iich tl bliquely deflr
fcrans\ ru^uloso, except two
levigate

bhtck pi> itadii; row
If of the ms: coriutn

innei¹ apical ai
)ale ij feUc body is very finely .

ces (jDtf1^.). xp.

mgl. JJ mill.

1Q1.

Serv.

t-, "i, p. >: (1813): D p. 359(1851);
En. li« , Hg, 1

I, divaricate, poiuted : 2-3 joip*
am po ty rugose and
aterai i produ< ss ^hich is obtuse or
abruptly
somewhat acuminate at the sides croulate:
iii les

■u a pa oii» straight.

1).

-050 to *D. i* Wesfcw., differs in tin

m mo; nished *vrith* sti-aighfc late
!gly rugose, lateral mnrgrins more remotely
late, prof*' lateral angles twice as long
20; broad, 8£; breadth of pronotal pro-

i, Assam (mi



:

ocL

;ii, p. 41

M, En. Hem., v, p. 1

b<

-melytra and -

.lor: b

■nder,

>sterioi-Iy produ< lo :

median, line on **hemelytr**, black,

longitudin: II, S., the Ia(o7*al m

Body

fee : heatl fcriangv.

cms or so¹¹

tum produced behind the middle in ; ■■

turning ovi nore or less

ger in <fT, har^

dark punci

youd the tyl

fihortost; **fourth rath**

(the first four joints vav ffeien*

jatrum reaching anterior eoxra: pronotnm

)se, somewhat c -shaped in front where it

iteous band between the lateral angles, which

ar

stout spines directed forwjp

■ defio>

ion oi

i brown ; lateral bo
 Teas md tht- -f the merubran< the
 ittlate elevated ridges, v. led '
 •ally most ii pule
 ■oiis, extending bcyoud the apex of
 •with hiaiya
 >ase of
 ag 17, fch at base of coi i
 pro

-;ely str juga contiguous, obliquely BI
 black oytondinor to the tirs
 oiat *m* r than the third, as
 long
 an tho fourth, Hometimes mostly black: proi
 the forni'
 Lween the ich are aoute, elongated and slightly *h*
 L6 serrated; a ti*ans verse, aometinjes test .
 callus on e^ch side near the anterior margi
 the tip, with a fe\» or many yellow specklea
 domen slender : homely tra thickly anc
 lody long, 14

i Pei Jikkim (mihi).

Ger Am. & Serv.

II; Wat

long, gra acuminate, slig!
 :ip slightl :

he m<

ost equal i of pron
IT ia a depressed porn ;ess, s
.extending- boarcely bey. middle of
!. .at: veins- brane rat;

it. SOC;

Ht; i

somewhat spinose : oCatellum bl ..ck v,
sides: hemelytra bla

Repo>

iklcim

Siukip isli- I *

i oacqus, puncturi : bo3y
beneath more obycare:
Long, 13- i

i

ported from

. *Tetro&a atomaria*. Da

<3\ Head testaceous,
leeting at the ap6x, lateral ^
portion

id faiu* \ punetun

in RIn

i own, nearly black, ptmctn ith numerous small warts simi
 iiose on the pronotum, and on ea at the base t> inc-
 line, which tapers to a point j ion of the
 mnotui several u
 o\ A points; m
 ique: b- ith au intern: md down
 bin the latent ^ta; &i
 ma! cfcus pnnctired -with brovvu: legs testaceou- iota
 tctnred with browQ: rostrum pale te fcennas
 ,o« (Dallas).
 He] ndia.

DA BILINEATA, Wnlker.

Fawu-colonr or blackish, or tue, ver
 !y punct.iu"ed : heaci verj oad ; jug'a ac;
 Uvnt promineui
 LntB black, about ono i I of
 the body; second joint a little *loi*
 ; fifth a l' r than the fourth : p
 Utly B' prono .thaantet:
 scntelltuB
 md> with t- -ipea whic
 to the ire bordered with black i the outer
 individuals of a dull dark red
 tack (Walker). Body long,
 14r-17
 m Java, Sn Sikkinv

onus G L

Jody ov: uch dilatod, foliacei
 it the eyes nnd forming an angle,
 rouotnm produced forwards in e] lobo.

i, Dall

n—No: iota.
 margins abruptly d the ay i or.
 rnally and near!/
 and with a distinct trans*
 mgose and with a distinct trans*
 the posterior tn: scutellum with
 witi I :ach ei'
 bro te black: margins of the abdome:
 blackish baud on <■•
 white : legs testaceoi.18; i'.
 >stram and an testae. I be latter
 somew
 ferr). Lo: : mill,
 m *Hi*, India,

438. GELLU OPTUSA,

if. Te[^]taceons, *very* thicl. punctured -.
 ted at tlx
 ting; / t a miimto black
 on each side in es: pronotmn v
 verse ridge near the hinder margin: BCutellura "wi
 black ih side ane
 whitial idomen
 tai*ed, with ctate **pit** on «
 •nt_f toucl> 0 prooedi!
 space *B* *da*, with an it*r

v\ith brown \tol K

black: I: **Reported** from N. Ind:

Gen as M

EBB. Htm., p. 6S (V>
 .. i, p. :
 Afric, i, p. 23! v, p. 11

Tlody very elongate : 1

the mil the head: oyes ver 'lj pi^v

liardly reaching tho insertion of the (; . f fe

n Rhynchofca.

not prominent; head, without posterior s] ; ng forwards ; poste
Hum elongate, rounded at the tip.
and the half of the abdomen: hemc-'. **ardly** al
margin of the abdomen to be seen ; membrane shorter t:
ceous portion: wings shorter than the hem abdomen >ovf
slightly ti beneath, elongate, as broad, at bui
gradually narrowing and a) **rnptJy** truncate at thi
of the humtl ast, long, unarmed; tarsi long {Am.).

439. M

is.

i⁷abr., Syst, 188 (1803J: Bnrm., Haiidb. Et i, p.

32).

DaUas, Li

Valker,

i, p. A

it. **nd.** Neer., iii, p. 4Z

, Atn, &■

Hist. Nat. Ins. Hcin., p

ISO fl8 err.

0 (186S rh.,

„, v, p. 123 fib"

■f the l iry long, bifid, **with** acnto lobes; head, **proso-**
iy and feet, cinereous, in ; antennro alone
. **Fabr.)-** Very elongate:
1 Bnlcate iu the midcile: antennaa
inser

pro> lie apex: pronotum smooth, a little
lea poi9tQriorly> pale deep black before the margin :
self white: scutellum el margin

vesceir margin white: wings hyaline : *b*"
black spot on both sides at the apex (*L. Jut*

;iam, I appines, Java, Sumatiu, Cambodia, Cochin-China,
mihi).

SCATUS, "Westwood.

20(1837); Dallas, List

Het., i

'rtd

I (1868): StW, Kn. **Hem**

Ist. STai m., p. 180
(1348) i

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;

lple, a »d as the abdome..

Los oblique, serrated; homelytra fuscous, marked with p
of the abdomen truncated (*Wesfw.*). Form somewhat simile
le broader examples c ., head and pronotum puuc-
ired aargins of tho pronotu-
■ongly transversely jugose; distnot median iongitudin f le
and fine anterior transverse wrinkle levigate ; posterior angles
pro-luced in an acuminate tooth (*Slal*). Long, 21 mill.
Beported from Java, Penang, India, China, Assam (mihi).

441. MEQAEHYHCHUS LIMATOT, Herr. Schiiff.

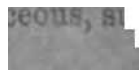
JU . Herr. Schiiff., Wanz. Ins., ix, p. 3
v, p. 124 (1&7C) : Distant, A. M. S s.J, in, p. -15 (ltf
jngate-obovate, broadest ovev L-onotn
longer tba' I: pronotmu
I Q U B
moderately acuto, though the \y pron\inent
i five weakly elevated longitudinal lines : the hem
tured between +!ie elevated veins: dark ochreons yell
lemelytra between tlie n ■ lose]
U it diffei^l i head
catuie-broad' jfcuation stro>
-ruginous, fuscoua on the hoa*^l
the pronotum aro not pallescent, they aro B!
angles slightly and somewhat obtusel., tous, no le longitx
dinal line or only a very obsolete one, no anterior trans verse v ire.
Long, 20-21 mill. Reported from Assam (mihi).

442. MHOATiKTWCHI'S TRANSVERSAUSj "W

iu Boyle's HI, Bofc. Him
DaUaa, List Hem., i, p. 356 (1861 Jj Walker, Cat. Het., iii, p. 493 (18®
ta&t, Stal, En. Hen-. II).
FuBcoas-black •. acutely bicomntyd \ anterior angles of pronott
odnced acutely forwards: pronotum andscntellum
coritim black, very thinly punctured ; membrane '
t black (11 (ODg, 15^ ; broad, 7^ mill,
from, the Himalaya.

443. MEGARHTNCHTTS DIVE?

. Walker, Cat. Ilet., iii p. 493 (1868J.
ibfusiform, IUUT-J



r. A

■ihync

id minn; ;h_e punctures black: head a I;
 than broad; juga hv be, connected: eyes not at all promi-
 nent: rostrum extending i >re coxte: antonno slender, pecond join!
 much longer than the third, as long as the fourth ; fifth longer than tht
 fourth : pronotaiu v e posterior B prominent and nearly rect-
 angular; eides in front serrated: soniollum ided at tl
 tip, with some black speckles along each side near tho base • abdomei
 witu the hind angles of the apical segment extending I he ans
 apj homelytra more minutely punctured than
 me (WaU i2^ mill.
 Westw., in ha^:
 s of the pronotum mo -minato and Mie tuorax
 more abruptly co

r.—On cert. Western Himalayas and
Dun.—By ALFRED GIBBS BOUKNE, D.SC. (Lond.), C.M.Z.S..

£' London, and
i by TEE SUPI ST OP THB ISDIAN M<

[Recoivod December 1 ni January 2nd, 1889.]

III.)

—These specim re co^l laced
ion by Mr. J. in, Superintendent of the
.11, Calc; y come ivow. tw IUD
. Delira Dan lies at the foot of the
it no great B at an elevation of 5— Eeet

Periony£_i and

The T dleti, E. Perrier. r[

non i in a sufficiently mature coi

Ley diff;

>is% Bourne ; neit

Tier ; nor to P. n

to a new species.

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include fchreo

:cies of Lu

nj rat

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Th<

are, like the epecirar as of Peri m_{jx} from D

tar to b.long to any of of

*'

I could only give oxoplete doscriptioi

observer who oi bem in a

regard to the genera and species of tl confirm. I am

now acquainted with seven distinc a family winch occur

in India-.

have not at present many data with

reen the to and the worm fauna,

I have Boated* t"hat Pa

of 5000 ft. and also atone of 1000 ft., but this h

which, arose from my collector having mixed

localities. I cannot find P. etv tt any great difc

mi.

* On Indian Earthworms, Part I. Preliminary N
irip an^t Sheyaroy*, Proc Zool, Soc, 1886, p, G67.

IV

Tent altitude
from *L*
>vel near Sydney and
Th

.rood on the Bhi<
::e the

a of worm from
the sea-level at
from the sea-
tins.

ween.
TI

bat exists between that of
as my

.(ions i rom thoio of

3, but I have never foun
do not kuov,- ho^1 'O present collection is an e
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U any

nch I have hi >id in Southern l

■ unt of

h grew ■ It
i-jf and Beddard subsequently i
e win-:
of tho^k

miuate in a " dis
^eta ends *divergt*

uderable ang-Ie eacii • o connected
extremity of the seta, which
:

abruptly **truncated.** whole set
ve, which **is** so c a character in th
i one direction. AK other **setae** of the
midd! *he*
middle of the

p, I

■ p. 64S

closely approximated to the posterior extremity part of
 h lies behind the dilated region is straight the gen
 E these clitellar setae course, from the bifid <.

" e that of imperfectly developed ordinary setae. That I
 real; with these setae is, however, clearly shown by the fact I
 0 several rows comprise -11 lam have pi
 o, and also by the fact that in two specimens of the
 high w came to hand, the structure of tl. litella*
 7 identical."

present also some variations in size. T! •la
 oft.¹ dian ventral line is usually if not
 ;litellar somites in
 • ith tho minute descrij noted a
 i IX—X *

immed..

rtt

Perrier si
 that the B<- •■
 ! tho ikes VIII, IX.
 X.
 the position
 and is moreover its position in P\ *siel*
 ;id *F a* These are all worms possessing
 charact :mon, and further investigation will pi
 list i '*a, P- MM
 rt, P, *qtiaJragenaria*, P.
 >ssibly, P. *qii* nd V.
 The organs described by Perrier as testes are do
 reservoirs; in position and structure they agree with I
 many other worms. I have not, however, been ab
 testen, but could doubtless do so in fresh sptv and
 prostates have been describe-h'gured them in PI. IIT,

Figs. 4 and 5- The structure of the spermatheca have been largely used. The structure of the prostate glands is a character

TYPHIUS MIVBONI, Sp. n.

External characters.—Length 130 m.m.; \, i in is, short and broad and can be first or buccal e. The latter is but very slight the set i devoid The other somites c , or eye- four annuli. The clitellum when t ■ extends body i i.
pov XIII.

The clitellum presents very curious structures about to be described. Between somites XVI and XVII, and also between somites XIX and XX, the following structures are the same as those described in the preceding section. The whole tiling is from the ventral pair of setae? The following figures illustrate the structures further. These lie in very distinct positions. The first is anteriorly placed before the setae 3.* I have placed the oil in the visible behind the clitellum; posterior end of the body. There are three longifid men. In figures 3 and 4, the setae are placed in couplets in a row. The width of the clitellum is about one-third of the body thickness. The most anterior boundary between somites V—VI are very being exceedingly similar. The next septa which are developed are, I think, a 1.11—IX, IX—X, and X—XI. These are all fairly muscular and placed close together, to say, they do not correspond in position to the external setae of the somites. It is therefore difficult to find out the system of nerves. The setae H¹ lies nearest the anterior setae.

seta 1 and so on.

LtU certainty which segments they Teally bound. All
fchi ii'o very thin.

•*ah.*—Tho mouth occupies the usual
wL pro itomram is protruded is overhung by it, but, as E
> mi urn can be retracted so as to be completely hidden by
buocal somite; the mouth then appears to be a&L

T Th< 1 cavity and phai-ynx roaeinble thos<
the struottu- described for that specie
"divided into two portions an anterior small thin-waUod coi
artment and a large thiok-walled portion ;rd proper, this
last

has a nacreous appearance on the o very th:<
ehitinous lay- It iotweer septum V"—VI and septum
VIII—

■ mites (VI, VII, VIII ilar
jands are attached to the walls of I ll.
,o alimentary canal ia considerably dilai uite XI or
XII,

of cesophageal fflauda being present. From the g
the co=opU,iguH is narrow, and beyond tho '
lens out at about somite XVI, it is also narrow. There are
four pairs of glandular bodies placed on t]:
;ion of the They are all bi-lobod and lie
dorsal vessel and not above it. (Beddard states that they I
dorsal vessal in *T. orientalis*.)

j^T *Ua.*—There a 'o tufts of i
phflryngeal region and a aeries of smal
BO I have Ily noted
sperniatheoal ducts. I am u
into further dotai' Uo nep
no^l which diiTers from Beddard's account
ah's and '*J*

Gt e organs.—I am anxious to exam
giving a full account of these organs.

A pair of ovaries ar ent in the n
eomit: XIII, bat the si =J being- very coutrt
impossible to be quite certain

The oviduots open to the exterior by a pair of poi
anterior half of somite XT

I luivs been unable to see the testes.

I have found a single pair only >£ semi ervoira and near fclu
a pair of bodies with a nac j)eamnce which
rosettes, je, I Hud the vasa d<

lertainj bu ently both the seminal reserve
and t.ee -osettes belong to somite XI j as meution*

We,

■ *ra Dim.*

urn which I liavo calc

X.—XT is n thick one, and very If!

and extend backwards over three ox* four somites.

The prostates (I reserve for the pro ;y expression of opiniot as to the desirability of retaining this term or substituting for it tho

tern) are large and lie one on either aido of the body. B irregularly coiled, almost DrangifScoloured, glandnl

«ih IIIa *ojio* end with a muscula openf

before it p S \ II. JI i'eren is connected wit' the body •wall. There is a muscular sac containing

long and ; project from the Httlo vc. These si

PI. Ill, Fig. 3. There are two v- ne of which *in* nei> inch ii onger than the other.

e pair of gperraaathecss, thr hioh lu- es VII and VIII, as shewn in PL II, J

ni in shapo, and rom the lulus -tout and muscular efferent duct. Opening i ho the i . ir of diverticui i. One of these is *

tri-lobt is appearance which is not posse i

*

.—There but that this w^rai be genus species of this g*. ?&

T. gammi.f

. should i rated about placinj? this worm without further LO species had not Beddard described th but this worm differs as much from either *T. ori*

'*T. i* as th- irom one another.- Beddatd denies the

3tenco of a prostomiam. *If*, this is non-eristent it is a very remarkable 3 and 4 are absent from the somr ii form Hum in *T. ori*< He does not mention their presence speaking of *T. gammz*. They are present m my species, although not al visible on a mere external examination.

Beddard says uotiling with regard to the arrangement a the brior region of the body, so that I am j' in a ding that 'ich I haved noted is peculiar to my species; H gives i such a striking appeai-ance that one could hardly fail to uoti Beddard does not mention cesophageal glands as present in eiif or *T, gammi*.

There is still some doubt, I think, with regard to the position of the septa in all species, until this is resolved.

ion of the I and ciliated
in *T*, the two most anterior septa are
usually VI—VII, is absent
in *I*. Septa which lie between
"NV. that in relation to
the septa *v m*
appears to have a position
omites as in *n* in

I
muscular fibres of the
:e, either backwards or forwards, to the body wall.
that three *t*
g. Three septa, b
three thickened septa, IX—*I*
id X—XT. In this case the sin[^]us
According to *BK* position of *T*,
, while in from his figure they would appear

pose to describe present species as follows:—
setae of two varieties lying together in the
very long, with a slight curve &
dilation at the distal extremity, while the
lateral processes irregular transverse variety showing
the distal extremity flattened and furnished
with **obsoletely** & I chevron-shaped
The setae in about the posterior third of the body
complex as in the $\frac{1}{3}$ -thirds, **but** are equi-distant from one
another, the ventral being slightly larger than the
between any two setae;
Two spiracles are provided with two diverticula, the
irregular

not suggest any modification of *B** definition of the
, but expect that some will be ultimately *n* *y*. As
or the character of the diverticula
the number of these organs the *n* is
of intestine of genus
Intestinal glands vary in different species, and
about the position of the

EXPLANAT!

•a in.

r. 1. *Ttrphxus*

anterior somites, m. mouth

pores ; . Utin ;

le poro.- palatory

-.

ate tlj numbers of the somites.

>r (malo pore) ;

HOO containing pemal seta).

;land

Kiul setce from *the* ,s:ime won". Ouo of eac

gland of Lioo

"6 to

dnofc;< "d.

^ame worm aoeu turned forv,-.

;verticdlam; a\$P. snui!! cac. .

W. Dohe

-By WILLTAM DoHEfr!

. J.. cited by THE SI

Mi

[Beceived and Road J.].

(With Plate X.)

Election of butterflies the Upper Assam from
tand Dec trded material for the follow:

Lens were taken partly in the hills beyond Mav
dent Naga country, fifty miles due HV

ud the B I fig- and Diki

The Be! £ a very poor one, t
c than usual. Tho nu¹

»orly represented to

postpone publishing a list !1 after ruy return therf

The dr •npeared about the en

id on i'-

• iiape ai ■ butt-

ed confirmation from -s sources. I

neighbouring islands of Sumtm, Sambav. Timor, the a

the reverse of thoso ir ln£ e winter months—Dem-

and February being tho rainv one-

similarly roversed there, the wet-season fo

autumn, and hy-season ono in the spring. 'Y

indirect evidence, but direct evidence baa not been w

Nio^ville, \ ho early adopted my views on this su me

'in the ud haa lately bred

• formB of *Mel an* a^er natural conditions from the c

the ocellate one. TWa, however, took place at th<

of monsoon. At any other time it- n ry am,

to come from the same parent. Two j ho earl

dry st ul of Sambawa, T

Melardtis leda ' and *i*

ing a wet sponge in the box in which the foi■;

T pOwrtricularly recommend this expenmont to natural."

East, a *nitis* lays its ogg* with unusu. ity in c

∴ ing rice i always o

change of abode. The dimorphism of many of these species is from my constant observation; a yet remains to be demonstrated by breeding. But in the case of *Salpinctes obsoletus*, the evidence is, the evidence of the prehensores, in itself irresistible, added to the thousand signs of the and the identity obvious to any unbiassed naturalist, and settles

beforehand what the results will be.

Another group in which much may be said is that of the *Bf* included by Mr. Butler. *Saipina*. Mr. Moore has

of Assam specimens including the majority of his genus. These are not local varieties. In a single glade in forest one may find them till, together with dozens of intermediate

have collected species of *Salp* from

Malabar : in the smaller islands, where *Euphvas* of the most abundant of insects, the dominant form upon Assam, is the dominant or let*

as in the border of La Lower Bengal, a tolerably fixed and constant mimic of t

In "ma to me that the results expected from

proved that such is the case, we prefer to i.

ingeroLis us can well be imagined.

Tho'to unfortunate here<

ordinary means ■ ios of both

sexes from ■most to associate some structural

kh the proposed species. The uvo

and i icular *Teri*

•n thrice confounded.

A group of together on the wet sand, c cases out

variety, v. Je; or, if there is anotJ

ppearqi . The next stream-bed

may

itaii; another breed. There is no reason for supposing that

these

i a of caaes, breed time. It would

bo

of ict, must play a great part in such D
\ jjr. de IS

ink, thos<
;eto thia cans*
ibed by Mr.

will be invalidated. 0 :

the gonas varies similar!;
races have no well-marked habit: I that ovei
iks coi; g them. The cutting down of ft
to **produc** neral amalgamation of varieties which p*

muck D tho scrub j*
Vba, th pen co

is a

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:

>r extern iug ha'
to h m and the obliteration of ' races.
tw, which n as my confini
. are by no means BO

It was p
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or b, of pr<
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ametl
ip uniT
the rai liered,

everywhere,
Some fei. earod from the region 'ost
thei unerl t' .11 neu'
of , and la the

;

ocellate brootJfl are tound :
aps occur wh.

erestiug exa' **bhe cffe^**

The larp
ilka • -long with the typical race
1 : Ii.vc generally Laker
e the oilier variety may be common i
mile away. In A I observed a remarkable case of
the female o jrmal form is du

W. D

'I but slightly clouded *wii* and dirty yellow. It
ken in the forest, moving slowly about in the deep shade.
tying among the s. The other was almost aa
brightlj
coloured iro white and rich yellow as the rual ring chiefly *h*
the absence of the sub; >w spot on the forewi bike
male it was always flitting up and down the sunny paths at
the
lges od, ouly alightiug from time to time for a moment
01

3 occurred, and there was no
possibilit
that fch lea could bo diilerent; but the forms were so unlike
thu.fc
most claim to bo call. hio. I might have
fa

different: I
with,
uaps i i from, the difference in station and habits, if I had
Aie same thing in in Borneo and
rain a female almost as richly-coloured
male,* flies abont with it in tho sunlight, and a duaky, dull
•rn lies bidden in the woods. But it; is possible that those
may correspond with those very slight ones in
011 \vi Butler ■, aud that
in qnesti'

in-f ■i exist in allied . pe<
i in some spi and h
■'st subcostal branch I here give a
o Indian Museum,
ar-ice to i

+ *T'r''h the costal Vein free,*
L-

- me, Mr. Forbos, In Ms " Wan-.leringa in the E
of a
or against e
not (.he mala of A
,o pure " tho *ms*

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bvionslj ■y, Bet

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>sfcal vein anastomosed- A- ; oiraen^
.females >

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(apparent!

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aired in and *cifanijartlu*^ and apparently in
 itre is r>;
 % female, in. which n=; uian three vr
 moses occi **costal** vein being united with the first s
 oh, tho latter **with** the second, *and that* v a third.
 TUo

a mentioned > I made a
8 similar to the aboyt ^

Tho s] ed **bolow** are in
 th

MS (fe M(
 n, p. PI. X, I
 id from tl
 ■ an-i or) to

1 It ■ ■11 i showing thr lie winj
 (-brown with a
 !»ase **unmarked** except by a ver
 above, tw

■OW Sp

' at tlie : or tlio np^ .nd
 11 half
 of the nJ' >d. obscu'ely through
 r line runs in a parabola from the co
 :t tOUClh
 median space, dis'tpi)ears ab i

I set i:

- • I^ci large—about
st no i

The laai.
re the

tho v.

As in

Jo. i a a consp
f the submedian
d of the male replaced I
<1 **and** apical palo area. B
cell find the onfcor n cloudei
∴ pical and

AJdATUUSIA, H
t-seaso

I differences befcTveeL
seasonal-specimens of the foioiw
L in the type. 0] orst of 1

iiical.

• **The tru**
be retained In • on ace com-
anywhere els©. I Lave often observed
a perch, **flitting**

Family A. *DM.*13 (or AVATUBA) DLUPI, n. sp. PL X, Fig. 2, d¹.

MALE, *above, fo* 'ick, quite unglossed, marking
 jous-fu the base, costa, hind-margin, and a few i
 ton I rufous-brown; two Bmalt light ochreoua sp ive
 uala, the upper 1 ; an obliqa -verse fulvou ilar
 being olon eparated o :e last
 a the fii'sfc tii
 outer ¹ borcii
 ;io-median
 ' feo the sc
 sloping oblique} a
 vein a . ile hal);

ng

B lowar, and in 1 I]

. covertd with diffused black >

rk, the marginal liae and a broader Bubmargini
 veins, black, iishiug- anally to mere
 streak

i the low-: the bJack spaces above replaced by a
 hlack spot in the lower me<i LJih ono below it,
 near the lower angle • and n

tge

wer median B

:C.

Uy, bordered inwardly by a darker

lest n»

i submarg

ma

hioh are a few ol

.-hite touches, between wh

and the lilac band He four good-sized lilac-white

and som i ferru-

,3 tone!

jut. Hartort on the

ng near Sadiya, an-

i Sadiya and

i ita. One or

two

i near nil JOB. II

flight it resemi

i have: u*alleJ
species, it n rap

the -rate, i
*. Tho abcV

i

•ire unusually appro
ually •in.
and *Dilipa*

Sikkim spe< ad
cloi
ifatlor, vai\ ragged
r

among :
.jjreotU i

stituted for *Eurytelida*.
nd *Hypolimnas*. There
ura groups, though the
ises from the use of the
ey cannot be dropped
essida, the *Nymphalide*
tis, *Euthalia*, *Parthenos*
y be separated from the
eries of genera from the
(*Cathosia* for instance)
eudergolis, in which the
t be formed into a sepa-
ista, which exhibits this
a close mimic of *Precis*

Neotropida than to the
eir reticulate eggs) seem
, though no doubt all
Asperidae cannot stand,
e enclosed spaces (later-
nt. They are trigonal,
e genus and sub-family.

e still progresses, and on account of the great
, I hope, prove a useful supplement to the labours

The former agrees with:
 broad blue spot
 hind wing and *i*
 above, b.
 is violet gloss, t!
 I lute sc The costal and first sui
 >•. de Nic6ville thought that tlr
 'a, Staudingoi^, Bat P. a.
 anited.
 •he veins sometimes free an-

Famii ^HALIDJE.
 i- Th
 ■in ally. Theso
 inod ti

mily L
 Sub-fainii
 n. sp., PL
 11, iho iuterno- pace and
 fchi
 Ine in some lights, •" i ■'.
 standing urn towai-ds tho
 baae.

Hind ia the lo abcoatal to the
the b submedian,
Cilia •lally towards the anal angle, 'ipt at
above ita am er margin oi
C'lia darker,
 tho fo2 ing white.
a n j sleml t
trans lino,
which g a Hue of six minnto dark and fivo in tho hindwing,
(in within
ing L very clearly d n its iu^sr border), t
 tho whole breadth of the t g and on i on-
 ! to tlio submedian vein. Traces of slender
 diacal
 in the lorewing near thi within tue oohreoua band.
 black scales, hiut!

the
 ■rd-
 is in Siklt coinmont.

L did not need in Assam at all. But in the <

W.Doherty

Tracts, at Sandoway and

L

p. that is rare, auotUer instance of " « to the Himalayas. In the Celebes, *I Z ^ pithecoju*, but a large protected *Pitlecop** (P *phcenix* common aud conspicuous. On the other l

ombok

bawa, and S»mt» oasi rf j

latorall;

tarn ,,,,... spec103

t-famtl

gB in lights £J
bluish, the «p. of the JI
with marginal spot,, I
, the low.
basu, oblong and mi than the othci-B • a «l«,
beyond the cell, divided by the, ^
longest; 0 along the lower side of tiio m
the base, a small part of it l_yill

the middle median into two port
sifP tnenin.

tl
clined upwards, r ^xrS -in almost from
spot above its it with a minute
fi^miiby errmlvei. mtca
a toft of long hair, " m

wnicnfo^aUea' £ on
of th, tal vein;

.m the median halfway to the sub
semicn-cular one dark in the middle, in the lower n>c
crescepcfc close to the marginal > [B, ,((nm ow
1 diffused spotin'th. ;;

Discal spots throe, o i_Rg the subm
, cons; in the middle, ,,lavatf

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rflies of the *Tagiades* group, % viii read wings. In
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intensity of its sweet odour (just as the aro: herbs of Hymettus
and Cyllene, as the shepherds there told me, are protected from cattle
the same pleasant fragrance that attracts the bees), and no fen)

knowjj ae has any sweet odour at all. Odours common to both

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Fig. 1. *Ma\$aga hartertii*, rx. sp., <F, p. 128.

„ 2. *Potamii* (o/ *Apatwa*) *itiupi*, n. Bp., <?, p. 1

3. *Dye* -Mnsou. J, p. I

„

5. *.Pkwtmffia mai* ,f, p. 131,

6. *Pithecops fulo-zns*, n. g^., cf, p. I

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JOURNAL ASIATIC SOCIETY OF BENGAL.

Part II.—NATURAL SCIENCE.

No. II.—188.

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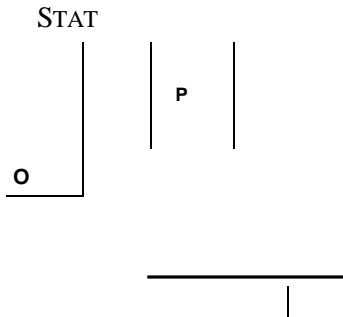
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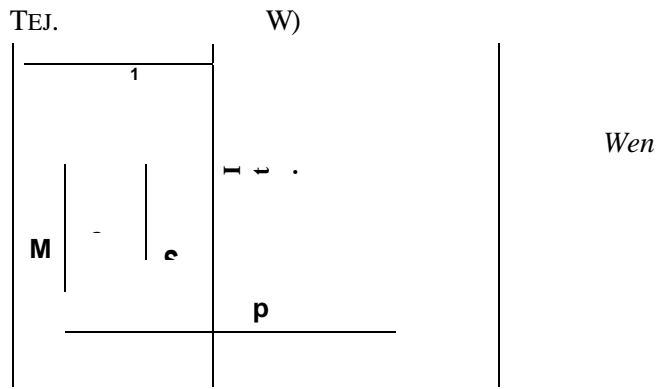
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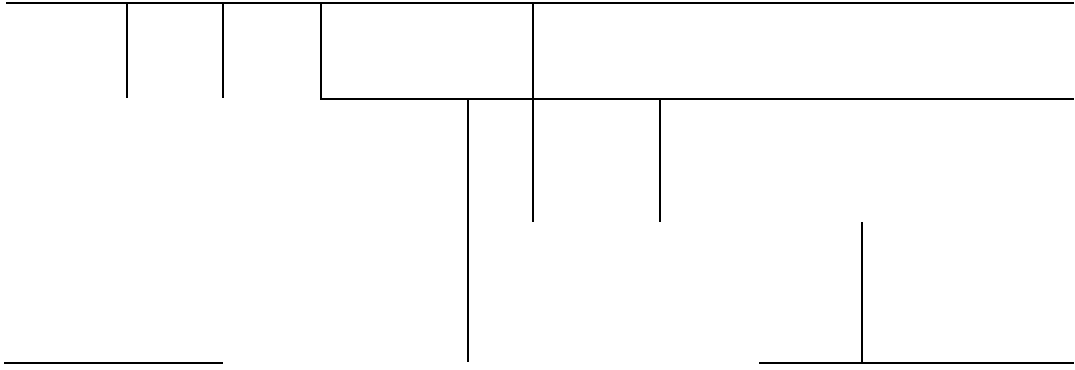
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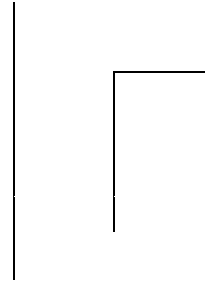
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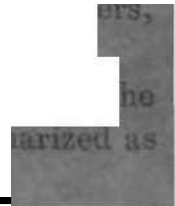
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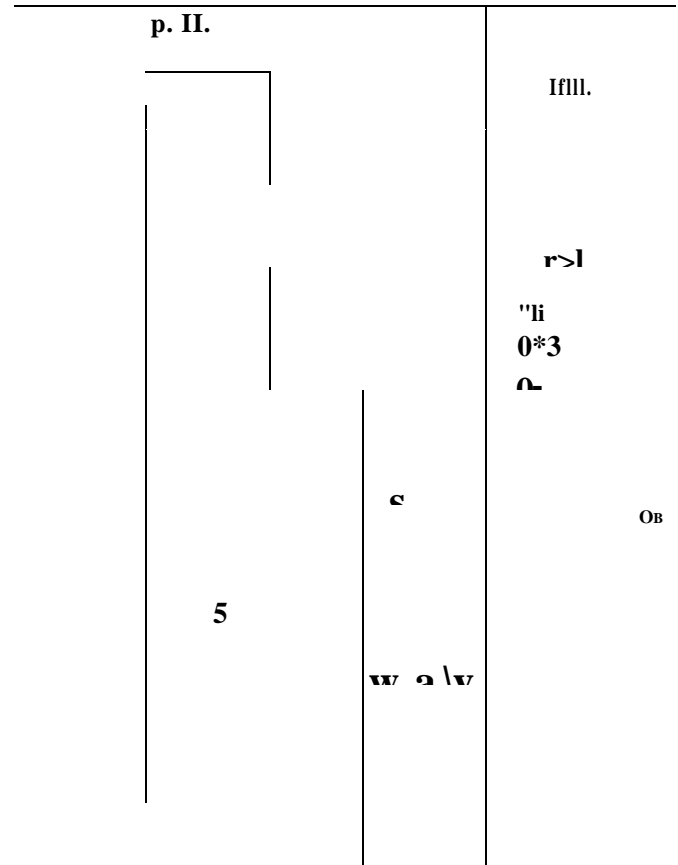
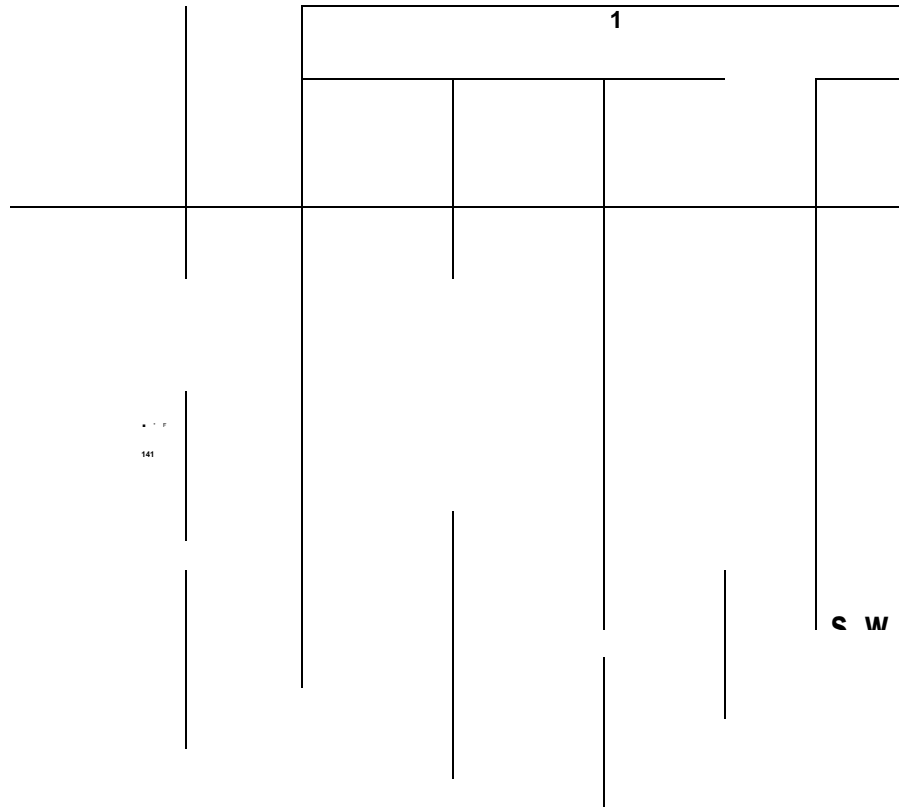
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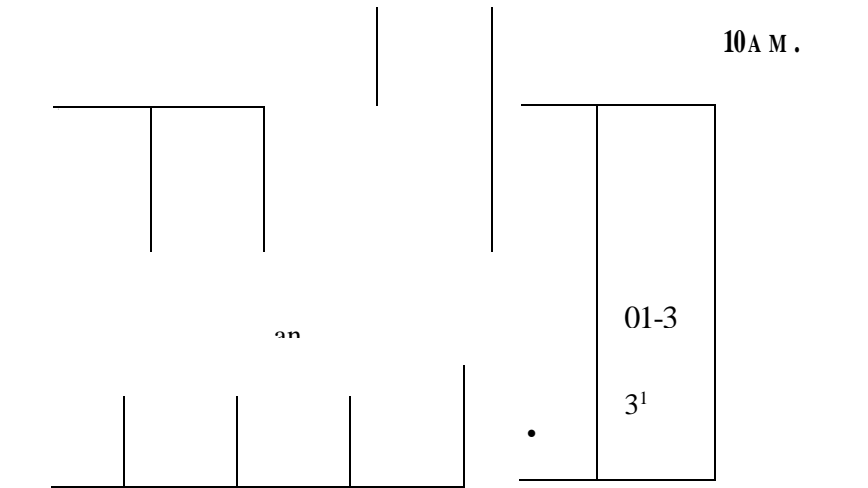
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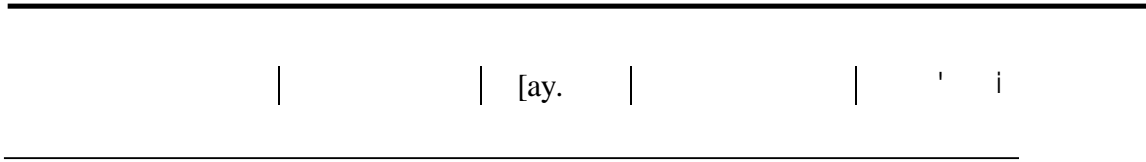
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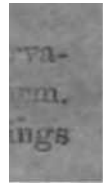
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(3.) *Abstract of Tahsildars' reports and replies to the questions set by the Meteorological Reporter to Government.*

QUESTIONS.

ANSWERS BY TAHSILDARS OF

| | BUDAUN. | DATOGANJ. | SAHASWAN. | BISOLI. | GUNNOUR. |
|---|---|---|---|---------------------------------------|--|
| 1. Date and hour at which the storm commenced in those places where it was felt and its duration at each place. | The storm was felt in the northern part of the Tahsil between 4 and 5 p. m. on 30th April 1888. Duration about 1 hour. It was felt more in Pergana Budaun and less in Ujhani. | Of the 5 Thanas in this Tahsil, 2 Dotaganj and Sudallaganj were visited by the storm. Also Hazratpur to a less extent. Was felt at 4 p. m. on 1st May 1888 duration 10 minutes everywhere. North-westerly in the beginning passing on south eastwards. No change in the middle. Estimated force equal to 16 horses combine d. | There was no storm so to all in this Tahsil, but on the 30th April 1888 after 6 p. m. there was an ordinary wind storm accompanied by drops of rain and very small sized hail-stones, causing no loss or damage. It had come from west. | No storm felt here or in this Tahsil. | Very strong and high wind at 6 p. m. on 30th April. Duration 2 to 2½ hours Gunnaur. |
| 2. Direction of wind at the beginning, middle, and end of the storm. | South-westerly in the beginning. North-east in the middle. Easterly in the end of the storm. | North-westerly in the beginning passing on south eastwards. No change in the middle. Estimated force equal to 16 horses combine d. | There was no storm so to all in this Tahsil, but on the 30th April 1888 after 6 p. m. there was an ordinary wind storm accompanied by drops of rain and very small sized hail-stones, causing no loss or damage. It had come from west. | No storm felt here or in this Tahsil. | Westerly in the beginning and then-throughout the duration north-westerly passing to south-east. No damage of the kind. Hence no estimate of its force can be accurately framed. |
| 3. An estimate of the force of the wind from observation of the damage done by uprooting trees, unroofing houses &c. | Uprooting of trees occurred. Force of the wind estimated to be equal to 3 elephants' force combined. | Estimated force equal to 16 horses combine d. | There was no storm so to all in this Tahsil, but on the 30th April 1888 after 6 p. m. there was an ordinary wind storm accompanied by drops of rain and very small sized hail-stones, causing no loss or damage. It had come from west. | No storm felt here or in this Tahsil. | Westerly in the beginning and then-throughout the duration north-westerly passing to south-east. No damage of the kind. Hence no estimate of its force can be accurately framed. |
| 4. Whether storm was attended with hail and of so what was average size of the hailstones. | There was a slight shower of hailstones. Average size 2 to 2½ tolas. | Estimated force equal to 16 horses combine d. | There was no storm so to all in this Tahsil, but on the 30th April 1888 after 6 p. m. there was an ordinary wind storm accompanied by drops of rain and very small sized hail-stones, causing no loss or damage. It had come from west. | No storm felt here or in this Tahsil. | Westerly in the beginning and then-throughout the duration north-westerly passing to south-east. No damage of the kind. Hence no estimate of its force can be accurately framed. |
| 5. How many people were killed, if any, and how they were killed, whether by lightning, falling in of houses, or from what cause. | No death due to storm in this Tahsil. | Estimated force equal to 16 horses combine d. | There was no storm so to all in this Tahsil, but on the 30th April 1888 after 6 p. m. there was an ordinary wind storm accompanied by drops of rain and very small sized hail-stones, causing no loss or damage. It had come from west. | No storm felt here or in this Tahsil. | Westerly in the beginning and then-throughout the duration north-westerly passing to south-east. No damage of the kind. Hence no estimate of its force can be accurately framed. |
| 6. What was the estimated value of the total damage done by the storm. | Faisalaid, mango and Jamun fruit suffered, damage estimated, 6 annas in the rupee. Trees uprooted numbered 5 per cent. | Estimated force equal to 16 horses combine d. | There was no storm so to all in this Tahsil, but on the 30th April 1888 after 6 p. m. there was an ordinary wind storm accompanied by drops of rain and very small sized hail-stones, causing no loss or damage. It had come from west. | No storm felt here or in this Tahsil. | Westerly in the beginning and then-throughout the duration north-westerly passing to south-east. No damage of the kind. Hence no estimate of its force can be accurately framed. |

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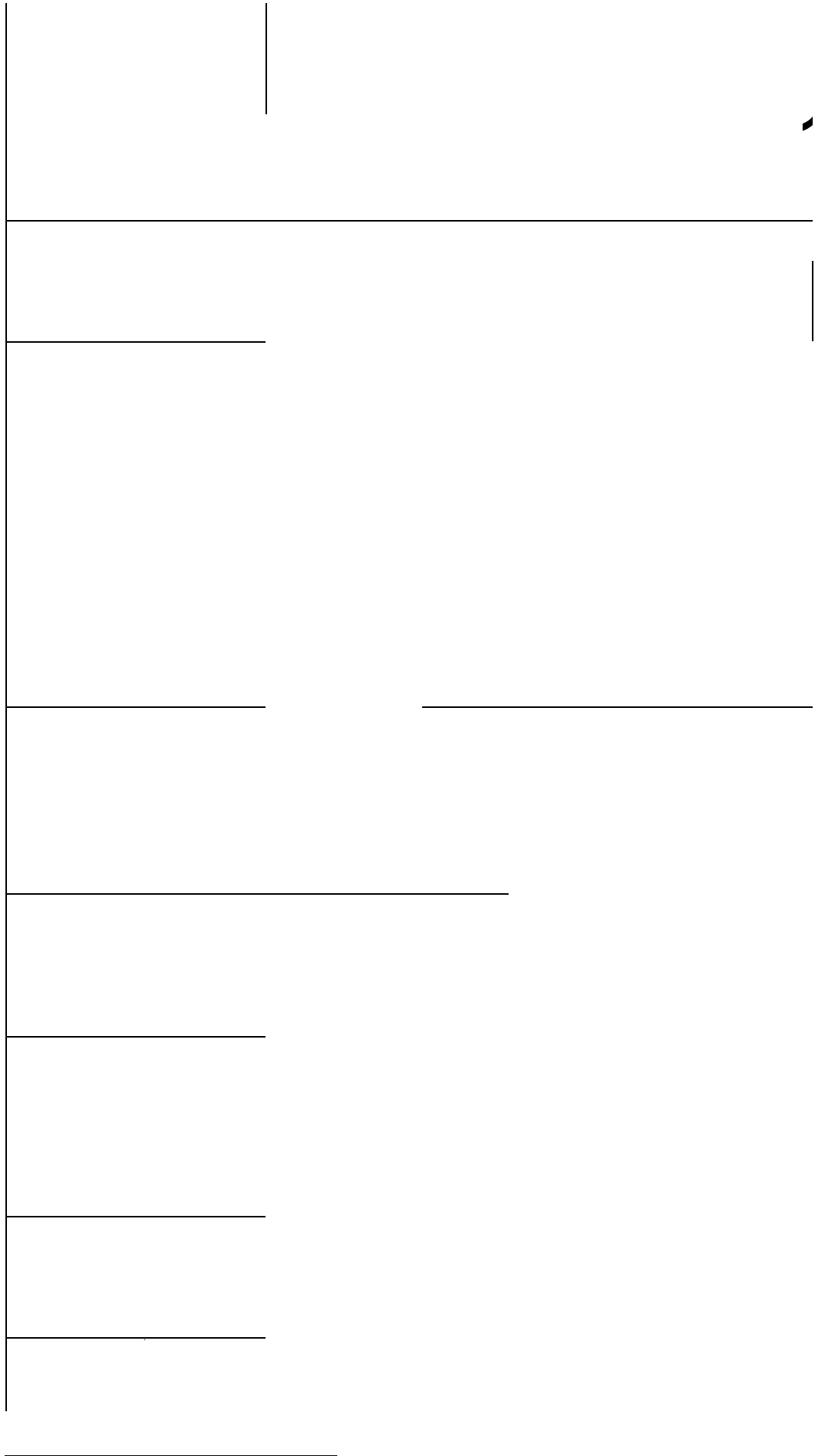
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APPENDIX II.

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and, by actual calculation, I have proved this difference. one of the five independent first integrals of the Mongian Professor Sylvester's into ion is, s_{ii} \y out of as s ug the second test but not the first, inasmuch as it conies hut of an extraneous curve.

ism has "been purely ne as I have eoi[^]. to the statement that the true inter]): u of the .still renui id, I now proceed to give wlia ought for interpretation of the differential en § 2. Gee >>'• trie I,



Co; the conic of ntuct at a at of any cur\ em to reclaim axes through any origin ; then, ii¹ », y he coo n point, and a, /8 those of t a of I have already e bed the systc: ^uationsf

between two consecutive axes of aberrancy, /> the elixneut of arc, of the "aberrancy car lee us of the cent -uucy), we have

$$ds'zzda^* + dp$$
$$_ds$$

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where

$$\lambda = \frac{r}{(3qs - 5r^2)^2}$$

$$\mu = \frac{rp - 3q^2}{(3qs - 5r^2)^2}$$

$$T = 9q^2t - 45qrs + 40r^3.$$

Therefore

$$\left(\frac{ds}{dx}\right)^2 = \left(\frac{d\alpha}{dx}\right)^2 + \left(\frac{d\beta}{dx}\right)^2 = (\lambda^2 + \mu^2)T^2,$$

and

$$\rho = \frac{ds}{d\psi} = \frac{ds}{dx} \frac{dx}{d\psi} = (\lambda^2 + \mu^2)^{\frac{1}{2}} T \frac{dx}{d\psi}.$$

But

$$\frac{dx}{d\psi} = \frac{dx}{d\omega} \frac{d\omega}{d\psi}$$

and, as proved in my former paper,* we have

$$\frac{d\omega}{dx} = \frac{q}{1+p^2},$$

and

$$\frac{d\psi}{d\omega} = \frac{9\rho^2 + \left(\frac{d\rho}{d\omega}\right)^2}{9\rho^2 + \left(\frac{d\rho}{d\omega}\right)^2},$$

where

$$9\rho^2 + \left(\frac{d\rho}{d\omega}\right)^2 = \frac{(1+p^2)^4}{T^2} \left\{ r^2 + (rp - 3q^2)^2 \right\},$$

$$9\rho^2 + 4 \left(\frac{d\rho}{d\omega}\right)^2 - 3\rho \frac{d^2\rho}{d\omega^2} = \frac{(1+p^2)^5}{q^5} (3qs - 5r^2),$$

so that

$$\frac{d\psi}{d\omega} = \frac{(1+p^2)(3qs - 5r^2)}{r^2 + (rp - 3q^2)^2}$$

Hence, finally,

$$\frac{dx}{d\psi} = \frac{r^2 + (rp - 3q^2)^2}{q(3qs - 5r^2)},$$

and

$$\rho = \frac{\left\{ r^2 + (rp - 3q^2)^2 \right\}^{\frac{3}{2}}}{q(3qs - 5r^2)^{\frac{5}{2}}} T.$$

* J. A. S. B. (1888), vol. lvii, pt. , pp. 316—332; cf. p. 322.

'■] A. ray—J
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This result may also be obtained without calculating the **value** of
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$$\frac{da}{dt} = -5r^{fl}$$

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VII

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of each tooth; the intermediate ones, however, are not so marked; tin's; \ho shows an Elaphine n

The antlers *avt* i i on moderate pedestal, the brow antler
tost a right angle beam, and subsequently i litlely turne
at the poiiiL; iiaH way up the beam t! *er anteriorly
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on the I< ore this, the median tine, tl. - vo more anteriorly:
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..."), and seems to agree with our specimen in nearly all respects;
re are, however, only S points to the antlers described by Tacssanowski,
■while our possesses JO points; in every other respect except
by M. i.»wski;
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IX.—On the volatility of some of the compounds of Mercury and
Tetal itself.—By AJOKX. PEDLEK.

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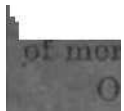
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 idly, ami Lister* uses, I believe, a kind of gauze containing :t.
 of thia salt or even cotton wool charged with iiv<; JKM-.-.ing- in
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$$\frac{f \cdot \sin f \cdot \cos^a \cdot a}{c \cdot (a^9 \sin^9 \wedge + h^* \cos^1)}$$

$$P = \frac{f}{a} \cdot \left(d I (a^* \sin^* f + \blacksquare \wedge)^* \right) \cdot \frac{k}{f + 6' \cos} \cdot \frac{A}{f}$$

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$$\mathbf{r} - \frac{\mathbf{r}}{r} = \mathbf{0},$$

$$\frac{1}{r^2} \frac{d}{dt} \left(r^2 \dot{\theta} \right)$$

$$= \frac{1}{r^2} \frac{d}{dt} \left(r^2 \dot{\theta} \right)$$

$$= \frac{1}{r^2} \left(2r\dot{r}\dot{\theta} + r^2\ddot{\theta} \right)$$

$$= \frac{1}{r} \left(2\dot{r}\dot{\theta} + r\ddot{\theta} \right)$$

$$= \frac{1}{r} \left(2\dot{r}\dot{\theta} + r\ddot{\theta} \right)$$

', we get

$$J = \int_0^{2\pi} \left(a^2 - \frac{1}{4} \cos^2 t \right) dt$$

$$+ \frac{2}{3} a^3 b / 2 \int_0^{\pi} \frac{d\phi}{(a^2 \sin^2 \phi + b^2 \cos^2 \phi)^{3/2}}$$

To effect the substitution we generally

$$\int_0^{\pi/2} (a^2 \sin^2 \theta + b^2 \cos^2 \theta)^{1/2} d\theta = \int_0^{\pi/2} (a^2 \cos^2 \theta + b^2 \sin^2 \theta)^{1/2} d\theta,$$

for, putting

$$\theta = \frac{\pi}{2} - \theta',$$

so that, when

$$\theta = \frac{\pi}{2}, \quad \theta' = 0,$$

$$\theta = 0, \quad \theta' = \frac{\pi}{2},$$

$$d\theta = -d\theta',$$

we get, by substitution,

$$\begin{aligned} \int_0^{\pi/2} (a^2 \sin^2 \theta + b^2 \cos^2 \theta)^{1/2} d\theta &= \int_0^{\pi/2} (a^2 \cos^2 \theta' + b^2 \sin^2 \theta')^{1/2} d\theta', \\ &= \int_0^{\pi/2} (a^2 \cos^2 \theta + b^2 \sin^2 \theta)^{1/2} d\theta, \end{aligned}$$

as the variable is of no consequence in a definite integral. By a similar reasoning, we have

$$\int_0^{\pi/2} \frac{d\phi}{(a^2 \sin^2 \phi + b^2 \cos^2 \phi)^{3/2}} = \int_0^{\pi/2} \frac{d\phi}{(a^2 \cos^2 \phi + b^2 \sin^2 \phi)^{3/2}}$$

and in general

$$\int_0^{\pi/2} (a^2 \sin^2 \phi + b^2 \cos^2 \phi)^n d\phi = \int_0^{\pi/2} (a^2 \cos^2 \phi + b^2 \sin^2 \phi)^n d\phi,$$

which is a particular case of the more general formula

$$\int_0^{\pi/2} f(\cos x) dx = \int_0^{\pi/2} f(\sin x) dx.$$

Therefore, we have

$$(a-b)M = \pi a^2 b - \frac{1}{3} \pi b^3 + \frac{2}{3} a^3 b^3 \int_0^{\frac{\pi}{2}} \frac{d\xi}{(a^2 \cos^2 \xi + b^2 \sin^2 \xi)^{\frac{3}{2}}} - 2ab \int_0^{\frac{\pi}{2}} \frac{d\xi}{(1 - e^2 \sin^2 \xi)^{\frac{3}{2}}}$$

Now, we have

$$\int_0^{\frac{\pi}{2}} \frac{d\xi}{(a^2 \cos^2 \xi + b^2 \sin^2 \xi)^{\frac{3}{2}}} = \frac{1}{a^3} \int_0^{\frac{\pi}{2}} \frac{d\xi}{(1 - e^2 \sin^2 \xi)^{\frac{3}{2}}}$$

ellipse is given

$$e^2 = \frac{a^2 - b^2}{a^2}$$

That we enclose

$$\int_0^{\frac{\pi}{2}} \frac{d\theta}{(1 - e^2 \sin^2 \theta)^{\frac{3}{2}}} = \frac{1}{1 - e^2} \left\{ \int_0^{\frac{\pi}{2}} \frac{d\theta}{(1 - e^2 \sin^2 \theta)^{\frac{1}{2}}} - \frac{e^2 \sin \theta \cos \theta}{(1 - e^2 \sin^2 \theta)^{\frac{1}{2}}} \right\}$$

Therefore, we get

$$\int_0^{\frac{\pi}{2}} \frac{d\xi}{(a^2 \cos^2 \xi + b^2 \sin^2 \xi)^{\frac{3}{2}}} = \frac{1}{a^3} \int_0^{\frac{\pi}{2}} \frac{d\xi}{(1 - e^2 \sin^2 \xi)^{\frac{3}{2}}} = \frac{1}{a^3(1 - e^2)} \int_0^{\frac{\pi}{2}} \frac{d\xi}{(1 - e^2 \sin^2 \xi)^{\frac{1}{2}}}$$

We have also

$$\int_0^{\frac{\pi}{2}} (a^2 \cos^2 \xi + b^2 \sin^2 \xi)^{\frac{1}{2}} d\xi = a \int_0^{\frac{\pi}{2}} (1 - e^2 \sin^2 \xi)^{\frac{1}{2}} d\xi,$$

where, as before,

$$e^2 = \frac{a^2 - b^2}{a^2}$$

Hence,

$$(a-b)M = \pi a^2 b - \frac{\pi}{3} b^3 + \frac{2}{3} \frac{b^3}{1 - e^2} \int_0^{\frac{\pi}{2}} (1 - e^2 \sin^2 \xi)^{\frac{1}{2}} d\xi$$

* See Dr. Schloemilch's *Théorie des Intégrales des Fonctions Elliptiques*, par Dr. Graindorge, (1873), p. 14.

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§ 3. *Express'on for A*

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$$\tan u = \frac{\frac{b^2}{a^2} \frac{a}{\beta} + \frac{a}{\beta}}{1 + \frac{b^2}{a^2} \frac{a^2}{\beta^2}} = \frac{a^2 \beta^2}{a^2 \beta^2 + b^2 a^2}$$

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§*Mean Value of A unit: of Intersection.*

Let us now find the mean **value** of the angle of in; ion
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therefore, in the

$$\text{rw I} \quad \begin{matrix} \text{ton} \\ = \text{ti} \end{matrix} \quad - \quad |$$

$$= -ah \frac{r}{J^*} \frac{a^5 + 6^s}{(r^1 - /)}$$

Assume

BO that, when

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we have, also the relations

$$a^* - f^? >^4 - 2r^a \quad (6^* \quad \text{OB } 2fl,$$

$$\sim r^* = (a^* - 6^*) \sin$$

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Makh. these substitutions, we have

$$(a - \frac{(o^a - \wedge > \cos 2fl}{(i - ' + b^x flin^* fl)^2 (re^* \sin^* 0 - \backslash}$$

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 Dr. Graindorge, (1873 J, p.

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angle $\theta = \theta$, we have to find the average value of F be the average value required, with

$$r = a$$

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whence

$$i \left(\frac{dr}{r} \right) = dr.$$

Integrating by parts, we have

$$L \cdot r = a \quad j+r = a$$

and the formulas in § 1,

we find that

so that, when

$$r = a,$$

Therefore,

$$*s r =$$

$$r^8 = a^8 \cos^8 \theta + 6^8$$

$$a^8 \cos^8 \theta = <,$$

$$\theta = \arccos \frac{a \tan \theta}{a}$$

$$\int r = \frac{a^8 \cos^3 \theta}{\sin^3 \theta}$$

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$$\hat{} = \frac{\text{-----}}{(1 - f \sin -)}$$

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to find the mean value of $4r\psi$; so that, if σ be the average value required, we have

$$\sigma = \frac{\int_b^a 4r\psi \cdot dr}{\int_b^a dr},$$

whence

$$(a-b)\sigma = 4 \int_b^a r\psi \cdot dr.$$

Now, from the formulas proved in § 1, we have

$$\sin^{-1} \left(\frac{r}{a} \sqrt{\frac{a^2 - r^2}{a^2 - b^2}} \right) = J.$$

Therefore,

$$(a-b)\sigma = 4 \int_b^a r \sin^{-1} \left[\frac{r}{a} \sqrt{\frac{a^2 - r^2}{a^2 - b^2}} \right] dr$$

Assume

$$\frac{b}{r} \sqrt{\frac{a^2 - r^2}{a^2 - b^2}} = \sin \phi,$$

so that, when

$$\begin{aligned} r = a, & \quad \phi = 0, \\ r = b, & \quad \phi = \frac{\pi}{2}, \end{aligned}$$

and we have

$$\begin{aligned} r^2 &= \frac{a^2 b^2}{a^2 \sin^2 \phi + b^2 \cos^2 \phi} \\ r dr &= \frac{a^2 b^2 (b^2 - a^2) \sin \phi \cos \phi d\phi}{(a^2 \sin^2 \phi + b^2 \cos^2 \phi)^2}. \end{aligned}$$

Hence, by substitution,

$$\begin{aligned} (a-b)\sigma &= 4 \int_0^{\frac{\pi}{2}} \frac{a^2 b^2 (a^2 - b^2) \phi \sin \phi \cos \phi d\phi}{(a^2 \sin^2 \phi + b^2 \cos^2 \phi)^2} \\ &= -2a^2 b^2 \int_0^{\frac{\pi}{2}} \phi d \left\{ (a^2 \sin^2 \phi + b^2 \cos^2 \phi)^{-1} \right\} \end{aligned}$$

Integrating by parts, we have

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THEOREM. If an ellipse is intersected by a concentric circle, the value of the circumference of the ellipse is $2\pi b$.



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$$B = \int_0^{\frac{\pi}{2}} \left\{ \frac{a^2 \cos^2 \omega + b^2 \sin^2 \omega - r^2}{a^2 \cos^2 \omega + b^2 \sin^2 \omega - c^2} \right\}^{\frac{3}{2}} d\omega \quad (11)$$

Therefore, finally, from (3) we get

$$V = \frac{\pi}{6} abc + \frac{1}{3} c^3 A - \frac{1}{3} abc B \quad (12)$$

§ 3. *Expression for the Mean Value.*

To calculate the mean value of the volume common to the sphere and the ellipsoid. Let M be the average value sought, we have

$$\frac{M}{8} = \frac{\int_c^b V dr}{\int_c^b dr}$$

which gives

$$\begin{aligned} \frac{b-c}{8} M &= \int_c^b V dr \\ &= \frac{1}{3} \pi abc \int_c^b dr + \frac{1}{3} c^3 \int_c^b A dr - \frac{1}{3} abc \int_c^b B dr, \end{aligned}$$

whence

$$3(b-c)M = \pi abc(b-c) + c^3 \int_c^b A dr - abc \int_c^b B dr. \quad (13)$$

To calculate

$$\int_c^b A dr,$$

substitute in (10)

$$\lambda^2 = \frac{a^2 b^2}{b^2 \cos^2 \omega + a^2 \sin^2 \omega}$$

so that

$$\begin{aligned} \lambda d\lambda &= -a^2 b^2 (a^2 - b^2) \frac{\sin \omega \cos \omega d\omega}{(b^2 \cos^2 \omega + a^2 \sin^2 \omega)^{\frac{3}{2}}}, \\ \cos^2 \omega &= \frac{a^2 - \lambda^2}{\lambda^2} \frac{b^2 - a^2}{a^2 - b^2}, \quad \sin^2 \omega = \frac{b^2 - a^2}{\lambda^2} \frac{a^2 - \lambda^2}{a^2 - b^2}, \\ d\omega &= -ab \frac{d\lambda}{\lambda (a^2 - \lambda^2)^{\frac{1}{2}} (\lambda^2 - b^2)^{\frac{1}{2}}}. \end{aligned}$$

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$$\begin{aligned}
 &= \frac{5b}{8} \left[\sin^{-1} \left(\frac{u-c^2}{a^2-c^2} \right)^{\frac{1}{2}} \right]_{u=a^2}^{u=b^2} \\
 &= \frac{5b}{8} \left[\sin^{-1} \left(\frac{b^2-c^2}{a^2-c^2} \right)^{\frac{1}{2}} - \frac{\pi}{2} \right] \\
 &= -\frac{5b}{8} \cos^{-1} \left(\frac{b^2-c^2}{a^2-c^2} \right)^{\frac{1}{2}}.
 \end{aligned} \tag{18}$$

Again,

$$\begin{aligned}
 &\int_a^b \frac{P_2 \lambda^3 d\lambda}{(a^2-\lambda^2)^{\frac{1}{2}}(\lambda^2-b^2)^{\frac{1}{2}}(\lambda^2-c^2)^{\frac{1}{2}}} \\
 &= -\frac{5c}{8} \int_a^b \frac{\lambda d\lambda}{(a^2-\lambda^2)^{\frac{1}{2}}(\lambda^2-b^2)^{\frac{1}{2}}}, \\
 &= -\frac{5c}{16} \int_{a^2}^{b^2} \frac{du}{(a^2-u)^{\frac{1}{2}}(u-b^2)^{\frac{1}{2}}}, \quad [u=\lambda^2] \\
 &= -\frac{5c}{8} \left[\sin^{-1} \left(\frac{u-b^2}{a^2-b^2} \right)^{\frac{1}{2}} \right]_{u=a^2}^{u=b^2} \\
 &= \frac{5\pi c}{16}.
 \end{aligned} \tag{19}$$

Again,

$$\begin{aligned}
 &\int_a^b \frac{Q_1 \lambda^3 d\lambda}{(a^2-\lambda^2)^{\frac{1}{2}}(\lambda^2-b^2)^{\frac{1}{2}}(\lambda^2-c^2)^{\frac{1}{2}}} \\
 &= -\frac{b^3}{4} \int_a^b \frac{d\lambda}{\lambda(a^2-\lambda^2)^{\frac{1}{2}}(\lambda^2-c^2)^{\frac{1}{2}}}, \\
 &= \frac{b^3}{8} \int_{\frac{1}{a^2}}^{\frac{1}{b^2}} \frac{dv}{(a^2v-1)^{\frac{1}{2}}(1-c^2v)^{\frac{1}{2}}}, \quad [v=\frac{1}{\lambda^2}] \\
 &= \frac{b^3}{4ac} \left[\sin^{-1} \left\{ \frac{c^2(a^2v-1)}{a^2-c^2} \right\}^{\frac{1}{2}} \right]_{v=\frac{1}{a^2}}^{v=\frac{1}{b^2}} \\
 &= \frac{b^3}{4ac} \sin^{-1} \frac{c}{b} \left(\frac{a^2-b^2}{a^2-c^2} \right)^{\frac{1}{2}}.
 \end{aligned} \tag{20}$$

Again,

$$\begin{aligned}
& \int_a^b \frac{Q_2 \lambda^3 d\lambda}{(a^2 - \lambda^2)^{\frac{1}{2}} (\lambda^2 - b^2)^{\frac{1}{2}} (\lambda^2 - c^2)^{\frac{1}{2}}} \\
&= \frac{c^3}{4} \int_a^b \frac{d\lambda}{\lambda (a^2 - \lambda^2)^{\frac{1}{2}} (\lambda^2 - b^2)^{\frac{1}{2}}} \\
&= -\frac{c^3}{8} \int_{\frac{1}{a^2}}^{\frac{1}{b^2}} \frac{dv}{(a^2 v - 1)^{\frac{1}{2}} (1 - b^2 v)^{\frac{1}{2}}} \quad \left[v = \frac{1}{\lambda^2} \right] \\
&= -\frac{c^3}{4ab} \left[\sin^{-1} \left\{ \frac{b^2(a^2 v - 1)}{a^2 - b^2} \right\}^{\frac{1}{2}} \right]_{v = \frac{1}{a^2}}^{v = \frac{1}{b^2}} \\
&= -\frac{\pi c^3}{8ab}. \tag{21}
\end{aligned}$$

In order to evaluate the parts involving R_1, R_2 , let us first assume

$$d\Omega = \frac{\lambda^3 d\lambda}{(a^2 - \lambda^2)^{\frac{1}{2}} (\lambda^2 - b^2)^{\frac{1}{2}} (\lambda^2 - c^2)^{\frac{1}{2}}}$$

and substitute

$$\begin{aligned}
\lambda^2 &= a^2 \cos^2 \psi + b^2 \sin^2 \psi \\
\lambda d\lambda &= -(a^2 - b^2) \cos \psi \sin \psi d\psi \\
a^2 - \lambda^2 &= (a^2 - b^2) \sin^2 \psi \\
\lambda^2 - b^2 &= (a^2 - b^2) \cos^2 \psi,
\end{aligned}$$

which give

$$\begin{aligned}
d\Omega &= -\frac{a^2 \cos^2 \psi + b^2 \sin^2 \psi}{(a^2 \cos^2 \psi + b^2 \sin^2 \psi - c^2)^{\frac{1}{2}}} d\psi \\
&= -\frac{c^2 + \left\{ (a^2 - c^2) - (a^2 - b^2) \sin^2 \psi \right\}}{\left\{ (a^2 - c^2) - (a^2 - b^2) \sin^2 \psi \right\}^{\frac{1}{2}}} d\psi \\
&= -\frac{c^2}{(a^2 - c^2)^{\frac{1}{2}}} \frac{d\psi}{(1 - k^2 \sin^2 \psi)^{\frac{1}{2}}} - (a^2 - c^2)^{\frac{1}{2}} (1 - k^2 \sin^2 \psi)^{\frac{1}{2}} d\psi,
\end{aligned}$$

where

$$k^2 = \frac{a^2 - b^2}{a^2 - c^2}.$$

Hence we have

$$\Omega = -\frac{c^2}{(a^2 - c^2)^{\frac{1}{2}}} F(k, \psi) - (a^2 - c^2)^{\frac{1}{2}} E(k, \psi), \tag{22}$$

$$\lambda = b, \quad \psi = \frac{\pi}{2},$$

$$\lambda = a, \quad \psi = 0,$$

we have also

$$\left[\Omega \right]_{\lambda=b}^{\lambda=a} = \dots$$

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$$= \frac{3}{8} \left[\Omega \sin^{-1} \frac{b}{\lambda} \right]_{\lambda=a}^{\lambda=b}$$

$$= \frac{3\pi}{16} \left[\Omega \right]_{\lambda=b}^{\lambda=a} - \frac{3b}{16}$$

havo

$$\int_a^b \frac{R_2 \lambda^3}{(a^2 - \lambda^2)^{\frac{1}{2}} (\lambda^2 - b^2)^{\frac{1}{2}}} d\lambda$$

$$= -\frac{3}{8} \int_{\lambda=b}^{\lambda=a} \sin \dots$$

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$$; s^* | \frac{n}{\sqrt{A}} \text{---} \text{f}$$

$$= -\frac{3}{8} \left[\Omega \right]_{\lambda=b}^{\lambda=a}$$

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The required average value of the volume is obtained by
 using from (18), (19) (21), (23), and (24) in (17), we have

$$\frac{b-c}{abo} \sqrt{\frac{v}{8b}} \frac{2}{2}$$

$$\left(\frac{2}{\sqrt{3}} \sin^2 \right)$$

$$\frac{c(a^2 - l^2)}{C i} \frac{Q \sin^2 c < > s i}{|}$$

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expressed in terms of elliptic integrals by equation (22).
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 have

$$\frac{\int_1^2 r \, d\phi}{\int_1^2 r^2 \, d\phi} = \dots$$

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If now, we assume

$$u = \sigma a, \quad \beta = \sigma \cdot \frac{ac}{b}, \quad V = \text{crr}$$

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$$A = \int_0^{\frac{\pi}{2}} \left\{ \frac{b^2 (a^2 - r^2) + a^2 (b^2 - r^2) \tan^2 \omega}{b^2 (a^2 - c^2) - a^2 (b^2 - c^2) \tan^2 \omega} \right\}^{\frac{3}{2}} d\omega.$$

Substitute

$$a^2 (b^2 - r^2) \tan^2 \omega = a^2 (a^2 - c^2) \cot^2 \theta$$

so that for

$$\omega = \frac{\pi}{2}, \quad \theta = 0$$

$$\omega = 0, \quad \theta = \frac{\pi}{2}.$$

Again, from the above transformation,

$$\tan \omega = \frac{b}{a} \left(\frac{a^2 - r^2}{b^2 - r^2} \right)^{\frac{1}{2}} \cot \theta$$

$$\sec^2 \omega d\omega = -\frac{b}{a} \left(\frac{a^2 - r^2}{b^2 - r^2} \right)^{\frac{1}{2}} \frac{d\theta}{\sin^2 \theta}$$

$$\sec^2 \omega = \frac{a^2 b^2 - r^2 (b^2 \cos^2 \theta + a^2 \sin^2 \theta)}{a^2 (b^2 - r^2) \sin^2 \theta},$$

whence

$$d\omega = -ab (a^2 - r^2)^{\frac{1}{2}} (b^2 - r^2)^{\frac{1}{2}} \frac{d\theta}{a^2 b^2 \cos^2 \theta + a^2 \sin^2 \theta}$$

Making these substitutions and putting

$$e^2 = \frac{a^2 - b^2}{b^2 - c^2} \frac{r^2 - c^2}{a^2 - r^2}, \quad \beta^2 = \frac{b^2 - c^2}{a^2 - c^2} \frac{r^2}{a^2 - r^2}$$

we get

$$A = \frac{b (b^2 - c^2)^{\frac{3}{2}} (a^2 - r^2)^{\frac{1}{2}}}{b (b^2 - c^2)^{\frac{3}{2}} (a^2 - r^2)^{\frac{1}{2}}} \int_0^{\frac{\pi}{2}} \frac{d\theta}{(1 - \beta^2 e^2 \sin^2 \theta) (1 - e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

But since

$$\frac{1}{(1 - \beta^2 e^2 \sin^2 \theta)} = \frac{\beta^2}{\beta^2 - 1} \frac{1}{1 - \beta^2 e^2 \sin^2 \theta} + \frac{1}{\beta^2 - 1} \frac{1}{1 - e^2 \sin^2 \theta}$$

we have

$$\begin{aligned} & \int_0^{\frac{\pi}{2}} \frac{d\theta}{(1 - \beta^2 e^2 \sin^2 \theta) (1 - e^2 \sin^2 \theta)^{\frac{3}{2}}} \\ &= \frac{\beta^2}{\beta^2 - 1} \int_0^{\frac{\pi}{2}} \frac{d\theta}{(1 - \beta^2 e^2 \sin^2 \theta) (1 - e^2 \sin^2 \theta)^{\frac{3}{2}}} \\ & \quad + \frac{1}{\beta^2 - 1} \int_0^{\frac{\pi}{2}} \frac{d\theta}{(1 - e^2 \sin^2 \theta)^{\frac{3}{2}}} \end{aligned}$$

Mof_ .hyay_ '

$$-\frac{1}{\beta^2-1} \int_0^{\frac{\pi}{2}} \frac{d\theta}{(1-e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

But from a well-known transform

$$\frac{d}{d\theta} \frac{\sin \theta \cos \theta}{(1-e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

rom tllc identit

<t
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$$(1-e^2 \sin^2 \theta)^{\frac{3}{2}}$$

$$\int_0^{\frac{\pi}{2}} \frac{d\theta}{(1-e^2 \sin^2 \theta)^{\frac{3}{2}}} = \frac{1}{1-e^2} \int_0^{\frac{\pi}{2}} \frac{d\theta}{(1-\beta^2 e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

M

$$\int_0^{\frac{\pi}{2}} \frac{d\theta}{(1-\beta^2 e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

$$\frac{\pi}{2} \sin^2 \theta (1-e^2)$$

xf

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$$\frac{d\theta}{(1-\beta^2 e^2 \sin^2 \theta)^{\frac{3}{2}} (1-e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

^

$$-e^2 \sin^2 \theta$$

(*»-

ere

$$\frac{d\theta}{(1-\beta^2 e^2 \sin^2 \theta)^{\frac{3}{2}} (1-e^2 \sin^2 \theta)^{\frac{3}{2}}}$$

$$\left\{ \begin{array}{l} (a^2 - r^2) + (b^2 - c^2) \\ (a^2 - c^2) + (b^2 - r^2) \end{array} \right.$$

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live List of the Tredineao occur/ing in thu N
of,< Mfas). Pt. IT. Puccinia.—By A. B.
AL B., JBengal

[Received 27th March j—Boftd 3rd April, lfr

(With Plates XII., XIII., & XIV,) In this second
instalment of a descriptive list of tlio I imenced ia this
Journal, Vol. LVI, Pt. I

s-acters of all tho 2
ding tbem artificially into two c
on boats other than tiio grassoa (and nd (b)
and sedges. Tho former list Fairly oompl

many additions % » in future t-
H18 lilttt tin

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scribing those ou the <
anoth BP on «p.,

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obs tl have filled XL\> r>y
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jm India for a year has oh
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of which thri iiovo, are new; and ni be eocoud l.

p are perhaps now. In the case of those species vhi
is extremely tliffipulfc to decide wli.

which should not. Any classiiciation of them must ■
until their life-histories are known. Of fch>

at which I have named Puccinia Rosa is in
a powerful odour, au< au all-
, exhibits o

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has dropped oat. ♦

I have arraii;

,a, Micropv

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the same subdivision in List IF., be*
•edospores are not produced *in those* cases in which

LIST
(**Leptopuccinia**).

on iv- , *ophylla* Lmdl.
fungus does not <ufc is abundant at
in fort. in Simla too It
In the . mycelium
of the shoots attacked, and almost every leaf
is paler in colour
perforated.
coloured and much smaller and thicker
The diminutive size is due to the fact
that
are attacked; when attacked, a
feature is that, when the
>, plan* most often
Lid smf ; which I can only compare with the smell of the stalk
of
H which suggests the attraction
[never only saw as attracted. The
only
is a powerful odour with which I am acquainted
(Pers.), and this fungus likewise gives it
tinted
in the *gemma* is so far away from it that I
had no opportunity for closely studying it. The mycelium appears to
be
. but I have not been able to] • The
to *mitosporo*
being very deciduous,
then only a fragment of stalk adhering to
it in May and June: after that the parts
remained by transmitted light are orange-red, falling
readily from the beds with only a small fragment of stalk
' *JJ*, in total length, and 18 to 22 /*
with .septuaginta The oospore is very characteristically
marked

no, striation pausing continuous;
spore a tv tucosoulike the
e are ii Iridoid, as nifi readily
be
7, Pl. XII). Placed in
ripenii The upper
low contents of the spore wander

promycelium di

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characters. *ia* elsewhere,* bnt w3] B
The leaves in a
arface, *yoa*

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tware, *is* au uncomiau

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and firmly adherent to their beds, breaking off with a long piece of
ing (7* tso niL-iisurcd). **Each oelJ**

Pl. XII'). The free end of the spore;
inted. The spore is **elongal**

■turn, and narrowing **at** both *ends* <

*L *I* measures when moist from 51—65 ^
;h by] 'th,
leugh by 14^

—1 *nd tL ing at
:
prom iourlessc* , The

a point *U* one side of the apex, ;
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htd., er iJ. C. ID
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Tlio *I-*

In one point, the end
has

ula species **provisionally a**

Pers.

■ o than Su
he forests n<
leaf usually displays
numerous

axe
a. in diai md eachmirrotmdei!
d with a let pntu' to
al beds a pother,
and when sci; .nie,
'k adherent **and llycomeofl**
. const
. the lower cell uarr)
end is more or

g usual_l_y

width at the sepium. The apical thick

r&s.—This fungus is probably identical with *I*
locality where it occurs, in October or earlier
spores of a somewhat different shape with P.

Micropuccinia.

Bfianh [01, Karsten.

on (, Sweet.

Dn- lane i

at the top of them (fig. 1
beds in little dark reddish brown
is occasionally open on the upper surface in
patches

examined:

ben in 'rpotit
more marked probably because of in-
cluding such cases. In one specimen I found
le of the stem where there
>phy (L, Pl. S31) with 0 rosy discoloration
os. Petioles were often found attacked and hypertrophied
on the stem and petioles were often, oblong or linear. The
my

■icfurnce

Hatt! nerve,
; con

II

-11 patches of invasion on the leaf blade
lower or •

■cs are brown and powder deti

rith only a small

; ad her"

fresh typir i₃t moistened mcasred 30 /* i
 and 16 y, in breadth at the septum. Spor te hours in water
 measured on an average as follows ;—wholo leu ■' f* ; length of upper
 cell 15'6 fx ; length of lower cell 14*8 p.; 1 at septum 17'6/A. Among the
 spores were some fine paraphysos. T! b curious tendency in these
 spores to divide into more than ;
 saw a spv 1 into oh 10/

or tul
 tently placed the os in water with
 ination, but on two occasions only su
 lation only in the U. In one case
 ■ spore witli a promyceli 'ig and 81*
 broad with colom-luss -
 a, but in neither c;;
 ay further.*
 d tbjs species provisionally PMCC. Q
 cw spet it does notag".
 , Cda.

Hemipucclnia.

QBJB, m p the leaves of this plant are often
 found i
 :nall pustules with s .
 3 neighbouring arc. at as a
 tinct I neighbour, lilach
 pustule
 [>ores also, which are oval. rnally
 , containing orange-yellow matter, and mcasu-
 Q raoist (Fig. 1, Pl. XII). The toleutosporea men
 u in total length rly equal in size
 The uppor cell is usually somewhat the
 17 fi against 15 ft, and is thickened at its free extreme I
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roraycelium w

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PL XII). The protnycelium m
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•j readily. I do not

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ad the average bread ill at
 . m, which, usually divides I aro^nto two equal pi
 T observed the germination of theae spores. ks.—TJiese
 characters agree on the whole with those of
 [.here can bo no doubt that the
 ma are In the Sim I have never obs<
 pas tales on r staJLk as in I ocios.

Schroter.

on J IIII.
 In July, soon ommenced, this plant pntsot
 which are en acked by a uredo-bearing
 in th< Ues b
 1 with Bpcrmogonial prod action. Ori
 ■L number of pale yellow circular pa are
 ■n, irregular!; d about, each measuring about 3 mm. in diam.
 The number ut^l j> 9 on each leaf varies from 1
 hin fch(oii'cular area, a c
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TI10 c
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pores hai
 -pines, and, when just wet i;ter,
 > ri x %l"2, fi. ^{Ti} at 50/*
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■dent K ■
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PI. XIII). Tl the

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winter, nml, **indeed**, do not fall off until i .),
but by **this time** now yongng leaves havi

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Bd.* If

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PI. XI

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D species no mention i

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Simla sj

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While **writing thi** I *foxui*

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Eupuccinia (heteroecious).

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«• surface

■r shortly linear. Tho

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13. Pi Schum.

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The spoi-es are r pyrif
!es. They are pu: >m 19-8 >; L3'5 M
to 10'2 x 12-8 /*. jro pti'

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Thi ntl 15 ;•

ur cell uinorgea from lint
near tlie Bep '-Haul,
measuiiug 12 x b

Epuccinia (antceciious.)

14, PUCUJIA Y: ■uhum.

i>. PUCINI:, [ay.
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10,
P

'y above quoted. I then noted that the
telentospores
>vni! md that I had no' inati
addle), however, I observed
iu.ni young
Banie c!) in autum
b in water. promycelium of the upper
11 its

i:in the septum, and takes a cours-
the upper promycelium. The sporidia are nar-
■H to ' 8fi iu width, on
short
and the proi' i tube opposil
n dian. The sporidia frequently germinate whi]
im.

[found similar young seedlings already attacked
but, although I made several attempts to . ice
^nly gathered and g< >>letk<
I am therefore forced to believe that the telci
igos on
i furth !-m.

LIST

17. P r,jEt nov. sp.

md A. W

i. The teleutospon.

IS t!Ot Uli' U.

the blade. The

e formed in July and August.

:s slightly constricted at the septura,

3 end, eaking off usually with

(V). In each cell n nue!

The whole length of the spore when n_

'eh 24 \u belong to the upper cell, and 22 fi to tho

e septv >oat 20 ji. Alter a winter's n

. each _AJ11 throwing out a charac-

-i the i >B first

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•ie eporidi

K 1 (X, varying from

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D A. li not common. It forms linear bl
e leaf. 1
ha\ Tho teleutospor
vo by the septum, not constri.

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21. I \ COEOXATA, Corda.

A. ou *Bni*

fieaar.

This fungus is not very common, and is **nsoally** fonnd in local itic
 rhcr wcidium on Ji^l *lens*, Pall., occurs. I have al'
 ud my belief that it is **related** to this mcidium,* although I hai not been
 able to provo it by experiment. The telentospore beds for ruinnte
 black p ints on *the* upper surfaces of the blade, sometime
 linearly; but they never coalesce to form 1
 urt" a^fo much ,[^]e-yoIJ d ulso on the
 BUid the leaf.

The ureduapores are pale saffron-yellow bodi me
 ing when just moistened 20 to 24/* in **diametoi**).

They germinate ID the tts

hree or four g

it only one germ

V).

coa **are** brown

ci-ov

ly arranged process'

PI.

V). **They are** I >n short stalks, and each a

jed nuclear vosicle. I length of

to 44 jw, the upper m 18

t the septum is 10 to **11/0**.

The

ilk, and is sc

constricted

m. They do not gern Xn

tho B].- Hey gerraina ly; tJ. m f_{rt}

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XIV), and th tie lower ce! he sept

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XIV). The aporida are o val bod

vat x 0 ft to **13** x 9/4. They **genn.iuati**

XIV}. **The pw** at the base in **eaorc**

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tie Bporcs* !ves ha

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the following :—The
 lower Burfaco of ti

»u8tulcs a

surface, and these are produced throughout the winter, but they appear late in autumn, and very early in February, whilst I have found the uredo pustules of the foregoing fungus after winter.

The uredospores are circular, oval or pyriform, and, when just mature, are yellowish, but their coloured matter is characterised by the presence of the spore, leaving a colourless space about 2 microns in diameter (see Plate, PI. XIV).

The teleutospores are often very numerous, and are sometimes found in chains, but they are not so numerous as the uredospores. They are also found in chains, but they are not so numerous as the uredospores. They are also found in chains, but they are not so numerous as the uredospores.

The teleutospores are often very numerous, and are sometimes found in chains, but they are not so numerous as the uredospores. They are also found in chains, but they are not so numerous as the uredospores. They are also found in chains, but they are not so numerous as the uredospores.

The teleutospores are often very numerous, and are sometimes found in chains, but they are not so numerous as the uredospores. They are also found in chains, but they are not so numerous as the uredospores. They are also found in chains, but they are not so numerous as the uredospores.

22. *Puccinia Agrostidis*,
Pers.

on *Agrostis* sp. ill.

la is very abundant. The teleutospores are forming black lines on the upper surface, when not very numerous on a single leaf, but they are very numerous on the lower surface, especially on the lower half, but they are not so numerous as the uredospores.

The uredospores are often very numerous, and are sometimes found in chains, but they are not so numerous as the teleutospores. They are also found in chains, but they are not so numerous as the teleutospores.

oval, and ran fire-yellow lie centre,
leaving the periphery filled

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6. P. ^«-

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11, P,

13. J

* J.

three new Homoptera.—By it. L.
bleated by E. T. ATKINSON, B. A.

[Received Feb. 28th ;—Bead April 3rd, 18

The i descriptions refer to the small hon-
ch a see on tbo mango trco in the ei t of t!
indeed up to the rains. Some account of tho^s> inset;
Indian Museum Notes,' VoL I, No. 1; and th* i
investigated.

CEIUT8

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S, 9. X nota^o,
'hyaline tegmiwum disiinotus.
LD. Suharanpur, Calcutta.

IUIOCEROS ATKIKSONL

Elongatus, flavescens: vertice media infuscato, puneto
lateralis media ut 'mo, nigri
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subtus

HAS. Culcutta,

li •e) *nig}is*

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J. Lethierry—*Da*

new Homoptera.

*us mediis nigra oriKtta: clypeo jlavo, in media
sum*

*nigra, ad basim latiori, noto Jtavo,
(lava, basi utringrue macula obtuse triauguluri
ni is, voids cwicolorihits, oe»«i costali
d*

*■ta : corpora *'M6/
ignx ; pedibits cwm.
pi nsignia.*

*Jashpur in the Ghata Nagpur
resident of the Indian Museum,
in the Medical College of*

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(With P) VI. — XVIII.)

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o in tlie Bay of Bengal during two seasons' v

miea aro not given, if- because
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ies, of which 11
{ aro rare spe i>efore met with ii
ire well-known forn

■pecies, 23 are from the OJ coast and th<
b of G ir, 3 are from the deeper open waters of
Ly, while 2 are from the past coast of Ceylon,

: These last (5 species are the fruit of **occaeio**
re loft wii i>ecies rep u* moi.
IT the Or or rather n coa
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: se of all Indian deltas where f ho
'ious advano «,ling muddy sea.
Low-lying
nd a!' tth Btiil lower-lying es
ine presents the unbroken **level** of a recently formed



alluvium ; the bed of the so a is an almost imperceptible slot ;jne
 mud, and the more or le id waters are co-
 shallow that the twenty-fathom line is distant from five to
 from shore, while the hundred-fathom 1 two miles, as was
 determined by the (In survey. Towards the south
 the sea deepens, and i

i with ems'
 and ail tlje families of the
 3 , while the surface
 waters

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1. PSETJ . Catalogue,
 iv, 401' Met with from False
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2- AKNO p., PI. XVIII, Fig.

1>. 8

Body rather elongate, its he
 The length or the 1; con tat nod ne.
 : to its height. The ■ jaw projects sli;_
 ■xI most as long as the eye, aud escavated in front <

Eyes on t ie, large, their diameter being i ed nearly
 times in the length of the head. A large patent nostril in
 tho

;cavation oJ iout above the upper e\
 e anterior bcim. month

te, Xho length of the maxilla is contai
 oad. A single !1 ahar;
 ach jaw. The head of the vom/

. Gill-clefi very wide : the mar;
 : I-rakers i fc, slender;

Integument covered with smal] , gti i
 jno 'lie coloured, oju

side. The scales invest the base of th
 jird of tho raya of the ver ins, at least on

j A. Alcock—*List of Pleuronectidae*»» *the B-*;

ft] line with a semi-circular curve above
! fin begins in front of the
exactly
the base of the caudal; its first six rays are prolonged
up more than half the total length of body. The
anal
from the ventral by a median double-toothed spine,
directly up to the base of the caudal; its rays are similar to the
anterior
caudal consists of 17 branched rays
of which the 16th is
obtusely pointed. The pectoral
as long as the head of the snout, and
pectoral is one-third less than the
well developed, and both co-
The left bases are arranged in a line, from the first to the
usual, the right is of the usual form.

inferior row

of
th-:
tra bla<ik. Colijurod pectoral with 11 teeth.
Lor
on
iilee south-of Ganjam in 25 fathoms,
bottom. Only one specimen.

3. BRACHYTYLUS XANTHI, PI. XVII, Fig. 3.

Bot! the total length
one-fourth of the depth to its height
forms the tip of the snout and there is a
at the snout tip, TJ* at its posterior end is as long
as on the right side, large, being one-fourth of the head,
are separated by a sharp ridge \ the upper is oblique.
Nostrils in front of the interorbital
space. Nostrils being valved: on the left side they are very
incon-

UO3 and are placed almost on the dorsal profile. Mouth wide
and
lingual. Most vertical arch: the maxilla extends behind the level
below
>d is slightly over half the length of the
head.

conical, curved teeth in both jaws and
on

upper: those in the premaxilla and
those in the lower [re%■

-raki ■•', distant, lanceolate and coarse]
I on their upper surface. Integument covered with large,
thin

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g

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■ *i-l* on the a

■ d side. *Lut*>

most on **the** up
nostrils on that side: the 4th to
the *male onhj*, the 5th to the 7r.h being tu
anul arises some *d* the ventrals, il
than one-third thf body height in 1>

the verl mdaj ha '-nys,
its

:i. Tli ■ set on
blind

ubh. a the colo^
they have 11

the ca.

.iad

the pylorus.

both occ;asious in j

m doabl
in the cui*vod hiteml line; but on these
characters, when there ure «<► wwy .enient.

4. I ui, (J.

her, **Cat.** iv

oot JVtru,
128 and 373.

■ *i-Bii'jhauui's* desor:

omruonly

i'OBUOJIBDS JAVANICDS.

Met

from hard sail'
bottoms.

Bleeker, At I us I ^"(no_f torn, vi, pp. 7

Bleeker distiugaishos this species from P
which **are** ctenoid ou both sides, aud by the

aura
and
enus
ts of

but
PP.

ken
ddy

iv, 6g 2.
by its scales,
of the lower

of the preopercle. But forth ters it
wish the one from *the* other, even lonr. Found
n
. • ; < • shallow and turbid water

RIŌCEI (Bloch).

.pi.
Thi ft was
in 7 to 8 ' .ition is m¹
•i turbi

8. THYS AXXTREW, n. Sp., Pl. XVI, Fig. 3.
D. Si.

e description of *H. i*
re much less nniueroi
t), bu
•e rom *urns.*
»ver half its length, without the
j), wit rior profile concave
total without the caudal,
The snout projects cons;
the eye, and in the male

The <

The lower eye is nearly half a i in ad * ml
y in its poste tu the
female half a diameter

y minute.

Tl ! most vertical; the length
ines in the head-length. Teeth
in a

single series in the upper and a doable series in the lower jaw ; they are
close-set, sharp and uniform like the teeth of a- comb Gill-rakers few
and distant, - first arch are only six. Integument covi.
th delicate deciduous scales, which are ctenoid on the colou
oi with very promiuenfc
tabes,

»orsal v equal
nearly is
a sharp

ie are 17 rays. The
pectoral

jht 1

developed, having 10 rays, the
much longer and broader than the

leuront

nd occupies the whole median line from the throa ho anal
is six rays. Colours during K/e—dull smoky brown with
a
of darker blotches round the coloured side inside thr al Una.
Vertical fins with dark speckles. The male with ten tall
mllianfc azure sp 'ie snov.
th : ma iches, fern
om 8 to 20 mileB S. W. of Pur id
once on clean sand.

The fish next to be described might, at first sight-, b • the
immature fonn of some larg-
Ling a second very simi] ite distinct fan
ire to c both
chu uch the
numt
in allusion to the transpnTei.

BUggested.

>v.
Jaws and dentition equal on both sides, D>
the eye, . snorr
!1, tlio length of tho

Vomei and cloe v. Al.
ical fiuB Bin d, weak, and G
looiduous, L
abu v e th e pectoral. &i 11- memb raues united at the
throa distant und short

9, Si noPTEBA, n, sp , Pl. XV
5 ? D. 8C88. A. 66.

Body pyriform, transparent and delicate, ita height being conte
i the total, without the caudal. Head si
in the total without the caudal, and t urths of its
tnso, barely equal to the eye in length. Eyes i
the extreme anterior part oi the iiead, separated from e a
longitudinally grooved ridge; the lowe* iameter
one-fifth of the head-length. Ti ,osfc vertical arch.

The length of tl
length of the aead. Minute teeth v in b ve, and
mer. Gill-cleffc very wide. Operole almost
membra!; the form of distant delicate spines.
Integument covered with minuti
scales Lateral line salient, with a semicircular c

height, ore
 Lqaed on to the end of the caudal. Vertical fins of strife
 extremely and Blender. The longest dorsal rays,
 the middle of the fin a the head-length
 .ys are . The ii; and
 elongate. The fsectoral is much
 more
 ; the o if liiJd forward it rear¹
 the hi the upper (]
 :ntral^ "rom fcho anal: the left is more expi

al ia long and being contained five tinn the

lines e parent white with mini Three
 inly, one of which 13 the lateral line, while
 I and interliff
 respec Jack with irregular mil]
 >ectoraJ grey ti] with black.
 mug to te three blnck
 1 sido

T^ miles E. of the mouth
 of the Devi river in the M delta, from a soft bottom of very fine
 £ Scianectes will be described among the fishes
 d more te Bay.

10. SOLI lson. •

line sand and
 mad, but

11. us, n. sp., Pl. XVIII, Fig. 3.

D. 98. "0-102.

•ios rcsei Sunther u-
 Atlas !5, pi. i, fig,
 3 form nnd arrangement of iorsal and ventral
 of the 0 body, and in coloration*
 ital lenffth. *Rr, .l with a*
 than
 nout fori: -i hook,
 iud the symphysjs of the lower jftw, touching f
 tlie anterior eye. Eyes situated in
 -way in advance of the loi\ length, and they aro
 about half a *rt.*

t. A ! ' .

On the coloured side two nostrils in front of tin
on the upper lip otenor i'onmi
length, the posterior bci On i
atril, of which the an*
papilla
The cleft of I h forms a :1c with the convexity for-
*from ■ ii iu th
gejaeneath th ■ s ctenoid on both si
5T-shap

the gill-cK
The doihal < om the t i tho
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ted fins extending from the **point**
ie no we? jaw **to the ■** The
II rayB and
i tho colonretl **tth** rows of Bmftll

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Pectorals fO *Of*, most eleganj. network
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and light green *ran* simile : ventr.

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12. SYNAI

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QUAGGA, (Kaup).

sebra of Day, Fishes of India, p. 430, but

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Lia, Commander Alired Car*
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distinctly line-encrustations. S

Dorsal rays black at the base, and pale milk-white

outlines

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Tail

of Ceylon.

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of *it*.

lies thin; big integral

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HCUICS. **Lateral**

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EXPLANATION OF THE PLATES.

PLATE X\

- Fig. 1. *It. Bp.*
Fig. 2. *>t, 11. Sp-*
Fig. 3. *Rhomboidichthys azureus*, n. sp., female.
Fig. 4. *Sciaenectes macrophthalmus*, n. sp.

PLATE XVII.

- Fig. 1. *Aphoristia wood-masoni*, n. sp.
Fig. 2. *Aphoristia gilesii*, n. sp.
Fig. 3. *Brachypleura xanthosticta*, n. sp., male.
Fig. 4. *Samaris cristatus*, Gray.

PLATE XVIII.

- Fig. 1. *Cynoglossus carpenteri*, n. sp., female.
Fig. 2. *Arnoglossus macrolophus*, n. sp.
Fig. 3. *Solea oculus*, n. sp.
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i muciferous cavities : its length (excluding a membra-
 ls of tho operculuui) 3§ in tl I. The Io
 ugly pr at, with a strong sub-s } ob, w;
 of the snout. Prcoporcu! border:
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 'tn angle and strongly serrated there and along
 >; feho inner with three srn;i]i
 >perculuni membranous
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 to proji !ie eye, which is
 i as above Lin ce nan a the oye,
 ud mar! KTMg ^
 iund th iferoua -9 of tho skull. Nostrils lai'ge.
 Cleft oJ: mouth very.obi the mandibles emit-
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 ,■ jaw. and large i s small
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 11 of med: Gill-cleft jjil I-rakera
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 uished silver.
 -tine is long and much coiled;"
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PI. XXII, Fig

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L. Ifft. oirc. 45; P. 16.

Bo i lei
of the head. B ■- scaly, wil s crests low an
Preorbital edge oronate; lar bor
single "weak spinom i'ho or
ridge; au<

Snout deep with a> a las:

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two-tliirds hug a *taodi*

Each limb of tlio '

i-with scaly ini Toug;

«,nd on the vomer : n

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eery thick cycloid on tho abdomen.

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i.-iolated: the first heel

length—two-fiSliB of th The aof'

OMB by a deep notch ; its middle raj

d; its laist ray in doable. Tho

str: length of the cau

lie total. The pectoral is broad and long with a

far yrior edg-e of the base c

loiigth to the anal. Coloai-s in life,

b? series of five indefinite traaisversG abdomen : a

large iridesceni

<iys bright ^pllow : iirogalav

Length, 4| iac'

Qua spec*

23 fat!

SJEBASI

^p. D., Pt. XXII, '

B. 7. D. 12

P. 19.

of body 3f, length of head about I p,
as long aa the eye, whi

in tor-maxillary notch, into which the knobbed symphysis of the lower

upstanding nasal spines, and a pair of short nasal filaments. The pre-orbital margin has four spiny points; the preocular margin four sharp spines and a short filament; and the opercular margin two diverging bony stays ending in flat spines. The interorbital space lies in the middle, where its width is only half an eye-diameter. From its floor runs a median groove with serrated edges. The supraorbital ridge is sharp

with a filament below. Two sharp reverted spines, one in the opercular region; and a row of three in the teeth. A broad ridge, with six similar spines, extends across the

snout, on the left of the mouth oblique; the maxilla, which is attached to the snout from the hinder margin of the orbit. The vomer is strongly projected. A large nuchal opening extends along the back of the head and the limb of the lower jaw up to the occipital condyle. The length of the opercular spine. Scales small and becoming very minute on the head and dorsal fin. The lateral line shows as 22 double keel-like spines. The 4th and 5th arc the longest and strongest in length: the middle rays of the scales very short, the

total length of the opercular spine. The length of the opercular spine is 11 times the greatest diameter. Colors: body and fins very silvery. Head dark bands above back with spots on the

ms dorsal. Total length, N. -by E. of Goj in 45 fathoms: bottom.

MISOUS IKERMISj 8p. n., Pl. XXII, -Fig B. 7. D. 11/1. V. 1/5 C. X3.

juished by feeble armature of head, and tlexible spines. I find body much compress*. Wait one-fourth,

juished by feeble armature of head, and tlexible spines. I find body much compress*. Wait one-fourth,

about one-third of the length of the orbital
with
two short flat distal teeth at its angle,
distal teeth
1. Edge of the orbital
s. Preoperculum with a spine at its
end with two weak denticles

Look—

ing stays i ■ hardlj
across the cheek ; and ridge across the
oss the temporal region. Snout Jeugth of the
head. Interoculai with a median longitudinal groove ;
and bounded by supra-orbital ridges.

Ft of month wide and oblique behind. A barbel
about the middle of the limb form teeth in the jaws and
palatines. Gill-opening wid<

a small foramen. Gill-rakei*s cL
it com; : it in
IB fcu

: k acid flexible, the 1.
;

filament reaches to the 3rd anal pectoral. Colours niinu
(e 1 >lack dots; throi
s the tv

Taker in 70 fathom3, ea
coast.

t specimens; the y of
hydroid polyps (J

s ■
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Body elongate

oakea a straight

horizon,

length of head 3^ to 3|-, iu tl, The he'
longfh behind the middle of the The si

;vndA half
\ overhanging the mouth.]
ion the mouth is si

bi-lobcd 8a]

a wide pool

The in ten •

and as broad as the cy. tg. Nostrils largo. Mouth *oh*
maxilla reaches the "om the posterior border of the orl
 i beBet **lip** Wf
n teefch in both ja
aba: Lh of which tho anterior four are canino-like ;
 iuuui t sharp conical t
 spiiiy teeth at if •■: t
 I on the
 .lies in the form of sharply-toothed do
cl tubercul os ctenoid. snout #nd infra-orbital.
 3 weak aud fiexi' a 1st very small, the 3rd and
 rheat and equal to nearly h i body I spino
 in :i tbo eye, and not Imlf the
of the

ht. Ventral.-. the

ial a sharp-pointed wedge ; its **length a**
life: bad

t>r : a blue blotch on operouium .

 ■nge. Tli 10li

hole lough of il cavity :
 simple tubular follicles of
are some **glands** in the
submucosa.

is larg

s long.

Mi ■ to 9 fathoms ; and

Fa CRAGHINH-

kgrees in almost every detail with
as taken at two or I stations near **sh<**
thr.J was f'ound thiee times in deep water.

URANOSCOPIUS COGNAJ'US.

p.

On pectoral rays tipped with
 seems ' ily a branch from the base of tho 11th.
have a [Tra-ocular filament, Thee are 24 yart

rcular border is completed by a membranous
Of tie three paira of spines beneath I
<;iids of the clavicles, and ihe otl
rom the pubic inien diss
mch enlarg. ova being -fa
Length of largest, spec;ine
Localities: Off False Point, in 10 fat
25 fathoms : 5 mi , in 25 fa'

or, Pr< 'ool. 01

ill hav

tlion I wor border
i pass from tne snow h eye_r
iverge to tern in a shai-p bitid flpine oi jmnit
are trans\ ^ws of small milk-white (in
oad and body. Diameter
ve sharp teeth about twv o diameter of t
o\o life:—dorsum metallic gi cllly si!
black: caudal with a dark base an«

■ tal length of the largest specimen 5 inoli. bocalities :
16 miles E. of moctb of Devi river in

the

dolta, in 68 fathoms : [Bay
■ HUB, bottom temper;'
kyab, in 100 fathoms, bottom te:
collection from the Mai
! D in 28 fathoms.

tare

Family P

Spt of a small *Lophim* v
mod. Lose resembl

propose to rojpcartt i»ecia.

D. 8/3/8. A.G-7. C. 8.

P. 23

Cephalic H aons; half

th

Hhidd

»f the body and tail to the base of the caudal. Long diamot
 about one-tenth the head length. T pra-orbital margin
 promi vwith two large simple spines. . In terorbi tal spaco
 concave ;
 i iu breadth. Mouth as broad as the disk : the anterior
 or, with the tongue and upper surface oi the branchial
 arches, coloured lib Teeth sharp and depressablo inwai
 ia two tv :a the tree in the lowei* jaw, the outer series
 mil. Two teeth on each side of the vomer, and
 Lfl palatines. Gills three. Branchiost
 oai dorsal spine slender, naked,
 ie second with a fringed edge : the third bristle-!
 .rs in l' od with narrow black
 : belly .and throat colourless. The stomach Eobu-
 oiled; and the fcwQ pylorus app :

S. of G an jam, in . horns, on a clean
 sandy

ine^l .vestigator* c i this
 en iu coast. In t.
 humeiul spiii wo smaller diverging spines at its base.

!y COT

Pi sp. nM PI. XXII, Fig. 5.

be very I to *Prionotw*
 ich it differs in having a scale-less u
 scribing i' community with *I'*.
 Hughes' scheme (Proc. U. S. Nat.

'B J3: anal rays II, Mouth comparatively
 two-fifths of the head-length, and the mandible
 Qg to the vertical from the front edge of the eye. No or
 I
 groove oa the top of the head. Free rays of pectoral tapering, and not
 expand ic tip. Black patch on spiuous dorsal diffused over ni
 , and not ocellated. Preopercuiar spine with a distinct
 :ers slender and tapering.

■•rbital prodncod beyond the snout. Spines on the head
 ivell-runcai

13. A. II. P. 1V3- V.)/6. 0.20.

of enormou tae, being longer (caudal excluded),
 der than the compressed body. Outline of the

gular, v>
Snout
39

resentic expansiou

. base of the caudal.

Lcock—

I-shaped, with two horizontal, advanced, *BG*:
prolongation of t: <l with a *m*
eyes, which are] a ore than two
diverge from one another
diurnal interorbital f
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PJ. XXII, Pig.

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XVIII.—*The Ethiopian and Oriental Representatives of the Mantode Subfamily Y&tidse.*—By J. WOOD-MASON, Superintendent of the Indian Museum, and Professor of Comparative Anatomy in the Medical College of Bengal, Calcutta.

[Bead November 6th, 1889.] ^

Genus 1. DANURIA, Stal.

danuria, **Stal**, Ofv. Kongl. Vet.-Akad. F.Srh. 1857, p. 169; 1872, p. 387, Bih. Kongl. Tet.-Akad. Handl. 1877, pp. 69-70, § 2 —Sauseore, Mel. Orfchopf. 1870, t. i, p. 309.

DISTRIBUTION,—South and East-African sub-regions of the Ethiopian Region.

1. DANURIA THUNBERGI, Stal.

Danuria thunbergi, Stal, Ofv. Kongl. Vet.-Akad. Forh. 1857, p. 169; 1872, p. 383, —Saussure, Mel. Orfchopf. 1870, t. i, p. 444, pi. v, figs. G6, 66K, 67, <? J.—de Bormana, Ann. Soc. Ent. Belg. 1881, vol. xxv, p. 23.

HAB.—Natal (*Stal*) ; South Africa (*Saussure, de Bormans*).

2. DANURIA BOLAUANA, Saussure.

Danuria bolauana, Saussure, Bull. Entom. Suisse 1869, t. iii, p. 79, j> . Orthopf. 1870, t. i, p. 310, r^l.—de Bormans, Ann. Soc. Ent. Belg. 1881, vol. xxv, p. 22.

HAB.—Zanzibar (*Saussure*) ; South Africa (*de Bormans*).

3. DANURIA SUPERCILIARIS, (Gerstaecker).

Mantis (Danuria ?) sttperciliaria, Gerstaecker, Arch. f. Natrgeseh, 1869, xxxv Jahrg., i Band, S. 210, ofc v. d. Decken's Beiaen in Ost-Afrika, iii Band, ii Abt S 13 **Tat. J, fig. 7, 7a., 7b.,** § nymph.

HAB.—Wanga, East-Africa.

Possibly an immature female of the preceding.

4. DANURIA ELONGATA, de Borre.

Danuria elongata, de Borre, Liste d. Mant. Mus. Roy, Hist. Nat. Belg. 1883. ly, d^l*

HAB.—Southern Guinea.

5. DANUKIA BUCHIOLZI, Gerstaecker. *Danuria*

buchhohi, Gerstaecker, Beifrag a. Kennt. Ortbopt.-Fauna Guinea's

HAB.—Akkra, Gold Coast.

9.]

Kongl

Genus 2. POPA, Stfil.

Popa, Stfl, Ofv. Kongl. Vet.-Akad. Forh. 1857, p. 169; 1871, p. 386; Bin. Sv. Vet.-Akad. Handl. 1877, p. 70.

DISTRIBUTION.—South-African and Malagasy sub-regions of the Ethiopian Region.

6. POPA UNDATA, (Fabr.).

Mantis undata, Fabr., Ent. Syst. 1793, t. ii, p. 19, no. 23, ?
 —Charpentier Orthopt. Deac. et Depict. 1841; tab. 38, cf. ?
Theoelytes undata, Serville, Hist. Nat. d. Orthopt. 1839, p. 152, ?. *Popa spurca*, St&l, Ofv. Kongl. Vet.-Akad. Forh. 1857, p. 189; et 1872, p. 387, <?. *Vopa undata*, Bates, P. Z. S. 1863, p. 473.—Sausaure, Mel. Orthopt. 1872, t. ii, 79, ? (redeso.).

Two males differ from seven females from British Caffraria, and agree with, a very large (63 mm. long) male from Delagoa Bay, in the Indian Museum, in the absence of lobes in the posterior legs, the sole character upon which *P. spurca* is founded by Stal, who was acquainted only with the male sex, of which lobeless hindlegs to be would appear to be very usual, if not an invariable, peculiarity.

Bates had already united these two supposed species.

HAB.—Cape of Good Hope (*Charpentier*^ *Serville*); *Stal*?
 Natal (*Stal* \ *Bates*); South Africa (*Saussure*); Bedford, British Caffraria; Delagoa Bay; Madagascar (*Bates*).

Genus 3. HETEROCHJETA, Westwood.

t? 2. Body greatly elongated, bacilliform, without foliaceous lobes, and spines.

Head between the points of the sharp conical corneal spines nearly twice as wide as the pronotum at its dilatation; vertex concave, its median and sub-median lobes lower than its extensive lateral lobes. **S** In the vertex the eyes are bent forwards at obtuse angles to the rest of the vertex.

Organs of flight coloured: tegmina with the marginal field irregularly reticulate, the anterior radial forked just before the apical fourth, the posterior radial simple, the anterior prong of anterior ulnar simple, the posterior 4-branched, the dividens anastomosed with the posterior ulnar just before the posterior margin, and the plicate vein reaching the margin, but sending its three or four branches through the anal gusset, v» which is hence venose: wings with the anterior area narrow and the anterior ulnar simple and unbranched.

.1. Wood-Mason—J?

308
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Representatives [No. 3,
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Foitegls: coxa obclavate, i ie in no;
iike teeth; femora narrow, smncras ab
eve the ^d on the ou'

sharp BJ

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on the disk with 4. Posterior
It-a.r spirn

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7.

1883

:.—Wes st-Africa: S>.
inland

2. Soxes ty small, d

Head tranavc
much prodacod above
and gn five lobes, at
■nedian with the h
the outer p E the sub-ine^
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Pronotum sly convex.
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■x of the p and tl
a shallow Ita dot}
mio Qtel y
Terminal tcrgamof the abdomen transverse,
lity. Cerci short, broadly foliaccoi

1889.]

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•tired. Tegniina: the veinlefcfs of the marginal and rarely branched and anastomosed so as

pic vy long and narrow me n*
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mgof Anterior ttuar <? 2-brauehed, 9 1-branched, poster
Ued, 9 'vidona not qnito

the

brand, tight and Wings with the an-

li mo

rtions is in the preceding¹; the coxro above

edn mora armed below on tlio outer edge with 4

spiit i, 3, 4), on-the ii with 13 or li a!

(np \ diich is followed bj

in each case by Oiie

any of the rest), and on the disk with -1; fcibiaa .

without foliaceous lobes, but provided icular iobos of

feebly 4-cristate femora ibitu filiform, terete

abovo, feebly bi-not longer then the next two

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n of tho Oriental Region.

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9. HETBI

Eipe Nymph.

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Li millhns., of which.

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l-Mason-

A lead. Handl. 1877, Bd. iv

Sexes alike. Body greatly elongated, ba
of moderate size, noi r than
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lobes, two lateral, w are alvn noidally produced o
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■li wide

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margin, -which appears
Butnrc **and** may or may not be pro3u<
which maybe simple or bii lied at the
forehead v

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Girai granulo- lOtum grei
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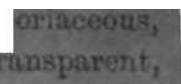
le of tl

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short, ab<5i a as broad as ;
iacc'ous, epatulate, rounded or

Organs f it when closed hardly ex
leir marginal fields

Bennojj&que,' the rest of the tegmina int..



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the rest of the "wings membranous, £ hyaline or a
1, 9 more or less distinctly and extensively
tes ellucid brown : longitudinal veins of tegmina very 6
lit; anter rked at or just b<
• rnosed to the anterior for
'Q at the si

■ort distance soov
whi tinct, colourless.

rior ulaar 1 or 2-branohed, posterior prong 4 k>5-bm
tfl running to posterior *jn.* o posterior ulnar; pli<
^in, its branches through the v.

which is hence v ; and the transverse veinlets etiryi ings
anal ion, unbranched anterior ulnar, aad first
efore the end of its basal thii

ior coxte I rior,
interior or upper tided at the apex into a
, their v concave, criatatt
i ues, of which

or, on I 1 and Last three sub-equal
with 12-14 alternately shorter and lo
Qg oues, and on with 3 sinall ones ;
red to eitli their thin mid-
1, terete above to within a litle of
tho Sf armed only on the lie apical
half of their inner brnptly liook
mora prismatic, ;h may
or may not be

submucronate-tri; ; tibia? triquetrous, equal to
ts, one dorsal a i
lobes, in which latter ca..

lot together al joint shorf, only about as

South Indian and]* Ceylonese

snb-ii.

70 spf bh well-dcvoloped corneal spines
iose structures in the typical species.

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th stornutD, equalling in length tbe four terminal abdpmii
ier, and widening iYom the base to 1 by a shallow notch into two points.

Anterior legs long and slender; coxa' bug tbo
apica

rest into a conspicuous dentate foliaoeoug lobe
nearly straight above, weakly arched below, with acute geuicnla

»o at obtuse ao.L

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with four strong crests,

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Genus 7. Er

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tinuiose especially iu the protliomx.

Sf<1 ; vertex slightly declivous, its
median i from the subnit-dian lobes by two longitudinal
depreg-

outwards 80 us to i
the pro))
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ngularly produced backwards, n;
a occipital cavity for the
and face convexly more declivous,

id from the side, the
aodian lobes of tho vert .x

by is formed by the c;

ati lo

un by the nai*row lateral lobos of

iiata lai ^e. ou a considerable eminence, which
bears

erect too¹
of! from the vertex by a groove. Ey,
convex laterally, produced abo\ of the laⁱ
i at the upper and
somewha' 1 finger-shaped i a-ncal
Pronotura roof-shaped with I Iy con
by. a raised dorsal line, whir ifcy of
abdonv

Abdomini
terga 1-7 produc Idle po
3, the last a broadly eonca\
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ir join r apex Oi .

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tnora narrow, s'iⁱ basally and then
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bed. with curved ac

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14. EOTHTPHLEPS RECTIVEJTTS, H

Body the colour of a dead

. semitransparer ilowish brown with the marg
and a lor **talf of th«** ;or pr;
anterior lit cinnamon 'ings
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with **the** an: **ale** yellowish brown and a
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Body c elong; iforni.
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hat of the eyes a mac'

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blunt and sub-bifid ; ey>

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il jjhicld I into three parts, one

■ proim "micirculn the anfc
 -wo lateral sunken snbqtiadra¹
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 Prothorax anbrugose, and roughly granul , y on tli
 dgea of tho pronotnm, mueh i shorts
 e equal in length to
 .Q abd' re of *Beg. med.*, quite
 its pronotu
 the sid transversely and the
 compressed, illy, in front, very sharp, and
 erior lobe with *a* rai

alh

roof-shaped mass with serrated si ides ;
 I accompanied by a very small and delicate fila
 middle of tho hinder murgit
 ly prominent, but without
Pitegumeht, in the ii line at hinder e
 n long. Cerci foliaccou "ra. as of
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 : pairs 1
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Ufieceons lobt >>ra n>
 ite, tho ending in a sharp

tuo Intern I lobes, also almo here ti:
 dge **with** 5 or 6 spines, on the inner edge with 1L,
 tibiae straight, terete above, ; the
 >ines in a .single short series docrea i apex.
 t and weak; ■, slightly tap
 id a strong blunt crooked ridgi
 Qg bent down near the apes,
 tlar g<
 lobes in the anterior pair, with the two
 ghtly lobed and t he upper or posterior ventral crest ■
 I into two ov more lobr
 bite longer *th* obsolotelj bi<
 orfcer than the two succed- ants tal

ii snb-region of the Oivi (egion.
 •nus ia **L**ied to *Toxodera* and *Paratox*<
 things, in the **oblique** 1
 ■d position of tho apices, of
 mer, but not with the hitti
 and mnlcellnlai in the annl c
 1^{ly} bifid afc *i'* -emity ; bnt it
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 im both by the possessaion of a distinct thoughl
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first joint to **its** four poste bdomen, a si

p., Wesfcw. & W .o-bi'own

the colour of a dead twig or of roti

a sharp spike-like p >n
 i the m opaqui .\vn.
 an

I streak e ng from the ba
 dor to ti
 each side of the veins of the disk,
 am
 I the base ■ anterior ra
 final
 id and like spots

rJiork of the anterior radial is distinct!

Wood-Mason-

tal L

: one side, indistinctly BO on the other. 'J I
 oh which is connected both with its own r
 and with the posterior ulnar, tin the only ii
 tome i is bran I e main stem oi
 »r margin dire
 lucid, inert .
 ly from the base, and \reaks on i•• w of
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 The fore femora^whi on
 i apises and on the it,

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 5'7S and 2S, b at sti ■! dilatatio
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 without aed. d-7 i middle u£ 4>th BI

win
 rth of tibia from ba
 femur 7-5. traal]■
 ;-;al join of antenna (abs*
 HAB.-

2. **Smaller.** Colouring the Same.
 The frontal horn is truncate and in the
 'in main stem of the pLL
 after auastomo i the di f which
 The fore femora are armed below **with S** on the **outer**
edge and with 9 10— U, <J 11—1J

of *Hie 2*,

<? 9 4—4 on the outer edge and ? 7—8, <7 6—7 on the inn,

In the posterior femorr; iho upper or p" rest bears
ttvo or three saw-like **teeth** and the dis ntral folia-
■ns lobo is divided right to its .miimfco sharp spii
iu front of it, of which, but slight traces are a in the other

upper angle of the penultimate joint of the i much
ps of tho terminal.

ital length *d* 78, 9 88 millims.; length of pronotum, *c*?
21*5,
anterior and posterior lobes aro respectively *c*?-
*d*¹ 17, **cal** dilatation 6 ■

2 4, at hinder <■■ length of nieso- and mot
met!. ill of; ii without seg. wed
5, 9 3"5, at apex of *Gib*
tni.i ? 4i, breadth at middle *d*¹ —, 9 7'5 ;
b J — 9 — ; fora¹
m base to

inr £ f — 9 11, 1st
en off), 9 (J-25, breadth 9 2. (TF. 0- *Taylor*).

HAB.—6 from all the preceding in having pines of both edges rnlar
series by some of
->tDers, and in having
nd from all

lot liaving¹ tlio upper <;rest of
jonsly the apex.

cos.

TOXODETU, Sorville. at. Fr., 1S37, fc. vi, p.
27.—Hist. nnt. d. Ortliopt.

alike. Body greatly elongated, bacilliform.

■s regularly arched,
hallow dii prcssions into a median
and

irated from tho unarm- rrmatal
• wo latter <if wlich a

ample lateral lobes, which, **with tlio** eyes,
he same plane **with** the rest of the vertex, being scarcely
all forwn a strong- ridge curves inwards and upwards
on

t at the ocular margin which is opposite to the

i- margin of the antennal serobe to the ends of the e[
are and is so dirt per end that it woul
enough pass tlie groove wl ates the lateral iY
! ian lobes of the vertex; tho facial shield has not shan
ing of the head, a **wide** space iutervei tween
ibed as a transversely-elongate
from its upper or l **i^las**

by the antennal .es are
w^l i out snpc , where they bear a hugo *si*
com^l 1.non-faceted spine. Stemmata large OQ uncut
front^l cu^l

on to th

. becoi; >xed iu l
horizontal in the anterior lol up at

the posterior lobe, is transversely convex,
of the middle line, and 'its on. if,

u. broad and shallow longitudinal depress
similar one on the enlarged anterior e

than brond, so ly compressed
ped, and, with the sternal region, so strongly aruhet '■

form, of a bow' being concave ventrally and eo: : is
surmounted l V anteriorly, clump deforming tho **surf** ft

. at the \$ broadly truncate-ro tun date, t?
dn^l lior end gives off a very narrow spirally coiled

58.

notnm, metautum, and seg. *mcd.* with a
v

rsal lir. ih is c ^n gly to' thi
th abdominal tergurn, where it
ho **eontituu**

The . 'vi.lils

g in slightly arched oufelinea ro its roundr
i no pos teriorly a **frin** *

tpper **lip** of wltich ttuiimtes in a delicate
which in the 5th and Cth is large, in the 5 fi

ous ; 9. sterna **2-6 with** sabequalfoliaceoua sab-q
catnres of the integument at middlo of hinder margins ; 1

eemioval, ro<^v <l, 1% ad as

lanceolate, divided at the extremity by a deep notch into two nduii

by more than two-thirds of

as *oi* flight equally well-developed in the two sexes, when closed,
to the f lobe of fcheSi w\y
i the e: that ilie apex in both is sn
at anterior margin, and nation
ider pair. All tho longitudinal veins remark;; Ut
Teg with tl cgina] field tolerably exj je, irregu-
anterii ked at junci
"ong running to the apex, I
the sti 1 narrow placed as obliqn
Lio-nlnar int. and extended on to
the
ins, the anterior proug of I irked, ;

he pos prong
videas anaai the
mce short of the margiu, the p!ic ich
gin, broken up into a reticulam eontri-
iiog. ii which enters the anal gusset,
anterior ulnar simple,
mder, .us,
ii on. ti ICSI-SJ! and oa
[*ough mora strengly curved,
and augulafe-rouded

H the i a disk
multi-t
es,
i of tho inner edge, and tho 1st,
of the outer edge, being subequal and
ten the-; ax posterior femora sli
lje ; eh side, both dorsal cr<

ost famished with 1 d foliaecous
■i* lobes long, bnt only half the length of the curved
■ equal in length to tho acicular ^enicalar
m, terete, v of a crest either abovo oi*
: lat joint of tarsus long, longer than the
or.

ii snbr^ ■(tho OriuntiLl R

17. 1

cifc. pp. 25 et 169, j>] ii, ofc pi. v, rf+

9- 1 only in its larger size, and in having the tegmina a little
1 with the brown blotches larger and decker-coloured, and
rior lo) be pronotam more bowed.

The fore are armed on the inside, right with 20 apim
 which . 16th, liKh and 22nd. of vrhi
 1st, **7th**, Lit'

the 71 n one bein
 ■med) -with 10, of which Is;
 13, of which 1 i, 11th, and **13th**, fro.
 apex are subtijual and stouter and **longer** than any of tlv

glh 150 millims.; height of head 7, breadth' **bet**
 ipa of oox-neal spines 13*5, length of corneai spines 2'5;
 length of

•notum in a straight line 57, of which the a ior
 ia are respectively 11-25 and 46, breadth at supra-coxal
 725, a iul 6, a IP lobe 3'9 ; height at mid
 of posterior

tut Beg
 middle
 ccoufl lobe of 5th tergxtm 10, of 6i'
 breadth at middle 14, of mar
 breadth 31; length of fore c length of tibia,
 from base to i\.

i of ini
 femur
 1st

;;.—Java.

. nus 10. PAM , nov.
 9 , Body greatly elongated, slender Lfom.

Head much as inthe.prec
 BX with the eyes dis*
 an and subniediau lobes, and the
 ProthoraT also much as in
 ofil lottun is straight; fur
 it thorn-like I a ai

:ind hard, minutely bifid developed
 I need lit its hinder end.
 rga with large er

do not end i '>fc; the preceding
 •raa 3-4 with **subequalq** i turcs
 of the integument at the hinder end. Cc
 ,-yond the seventh sternum, broad **pyriform** in o
 their upper third bont outwards and downwards at an Sbtuse
 th angle to the remainder.

The organs of flight do

of the Mantodean Subfamily Vavidae.

not reach beyond the end of the £01

n, but they are of much the same shape and

are,

the chief differences being that in the tegmina the stigma is *i*

lar and in the **radio-ulnar interspace**, extending- ou to the two bounding

the **posterior** prong of tJio anterior **ulnar** is 7-branched, **the**

interspace anterior prong of this vein ami tin rior

•, not wide **and** multicellular, and I ot is

traver y the posterior branch of tho plio

ht anal c: ation is present,

ta of **the fore** eo.\ iroduced o

shapo and **but** the for

pined on the outside and 15—16-spined on The

four p< obes i:

TtiKDiiux.—TK **yan** snb-region of the Oriental .Region.,

us is v< y allied to

ie. anterior lobt: e pron

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d foliaceous lul)

mrdoul

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other I in **having** femora

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ulnar cell of im-

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i very short and brbail p-jriform in

wliich, in my estimation, amply

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justify

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. n. pp.

gs bro^vn the colour of a twig, **with** the hii

>liaceoua appendage which arises therefrom, wliity-

E pronotum very strongly l looked and pro-

Itbe second hern erect, divided transverstily into two

duc i ml, \v' l i ned fo r w a rd s ami rath o

r larger

:• lly into two points.

MOJ a to anterior radial, which is thrice

an-

niihited with wbiy-brown, and a large **irregular** triangular mottling

ling **the** **i** in the **transverse** direction nea
disco: **aud** in **the longitudinal** direction for
about t-
thirds of the distance !• jma and the apex, op
■rown, the rest of **the**
orgai with a touch of gre;

Anterior **margin** of wings serai **translate**
streak th vaui rest).

line with I ,/liity-brown.

Fore tibi aed on the inner
number the 1st, 8th, **14th**, **23rd**, !
h, **16th**, 21st₃ 27th, and **29th**, and on the on
iit;h the 1st, **81 h**, **L2i i..**

8th, **lltk**, ami **L5:**

t ! **third**
In **the** four po
or upper ventral
tion 3l fid
lobules, of **wh**
upper do: st, int- >, of which th'
tlic **midri**

whicn

ted.

] 12 !.

pines t **of cot**
44, of which th r lobes U
ii at s **latation -i**, near bin
■ aud
idoxnen .-. mod., to end o
hru:;<3 iddle of 4th segment 6, h<
tn 10'5_t of Gtli tergum
2 'o 8*25, of marginal field

2'75, length of tibia form base **to** u

mur 13*3,

tibia] **aH joi**

G.

HAH.—Java.

JOURNAL ASIATIC SOCIETY OF BENGAL.

Part II.—NATURAL SCIENCE

No. IV.—1889.

XIX.—*On the Tortoises described as Chaibassia.*

By R. LTDEKKEB, B. A., F. iteceived September 4th

j—Read Nov. 6fcfa, 18ft

(With two Wood-cuts.)

In endeavouring¹ to determine the true a ;BeU
fossil tortoise in the British Museum, obtained inac
fid which I have described n Ucoii-
ogia I * as a form apparently allied 5 n-
iii the *I* of the hypopl n o the
ear ted that it mi^ht prov« to be identical wi B im-
existing form described as *Chaibassia Inata*
Unfortunately, the British Museum possesses no -*am-
I form, mid I, therefore, wrote to my friend Mr. ood-
!te loan of a specimen by the aid of which it cou
fossij shell was or was not an allied type. In reply
plication, I received two specimens, one of which was the
of a female collected by Prof. V". Ball iu **Sirgnja, Chota** Nagpur, while
cond was a male specimen, preserved in spirit, lined
Lga Hills in Assam, and wa3 one of the types of *Chaibassia*

A of the two .specimens with the Siwalik fossil at once
do wit] form so closely allied to *Chaibassia*
rtata that it was in all **probability** specifically identical; and **the**
question then arose whether there w **justification** for the **separation**

* Series r, vol. iii. : pi. ssi, fig. 4,

nical **Bengal, form**, and also regarding *Ohaibassia* as c

----- 1""*5 to decide these poi
..Ivan age of **consult*** ,h ,my *itiend* ^ f. ATM
Museum, to whom all students of **the** Chclonia ,lre
mdebtod for Ins recently published logne - . ,f tllat """"""

I'tlntitr' " "S .—^ both came t o t-
*basna, theolald** was not separable' fro,, : ,artWa an(,

■ that the genus *Chaiiassia* itself was not a valid **on**,
base cone umons, it seemed advisable to put them **o**

The to: on which the
ea was **originally** described by '->;
. upon the evidence of
%* gal. I had
I

"W be^ . **tga** Hill,,
b^D-i -ttaheso-caHed-.
show,
presence of **a** tc, m zvsromatio nTM l
accrdingly deflnedj, ! 1 M J g o ^ t o ^ d e t
In the co4e of 1 is des,
Wl; ed that 0/

■ : there.,

- inXUy mlioZ: t' S *

. x, it is very remarkable that Mr. Tl [' , , "
ed what he regarded as the.generie **'JH**
be two form_K placed respectivelv in th. , , '

have therefore been united by Mr. Boulenger.

* Catalogue of the Chelonians, Rhynchocephal
Museum: London, (1889).
† J. A. S. B., vol. xxiv

, p. 714 (1S56). , o>t. Rept. Britiall Fnata ,
(1876).

Three years later Dr. «T. Anderson* gave a further description which he described it as allied to *Cha* but with a bony temporal, or zygomatic arch, the feet not webbed, and the hypo-plastra? - usually attached to the carapace only by ligament. The Assam species here described under the name of *O. tkeobaldi*, and was distinguished from the other species by the contour of the first vertebral shield, the shape of the orbital portion of the head, and certain slight details of the carapace.

In his paper on the genus of Chelonians, Mr. Boulenger introduced the name of *Cha* after *Geoemyda*, stating that he had made a further investigation, and had omitted it from the list of well-known genera. The diameters of the two species likewise given in the catalogue are deduced from the description of Messrs. T. Boulenger and G. Boulenger.

On comparing the head of the male specimen of *Cha* with that of the female, it is at once apparent that the slight difference in the contour of the first vertebral shield, and also the slight variation in the shape of the orbital portion, but individual peculiarities; and that still more differences occur in the series of specimens of *Cha* preserved in the British Museum. There has, indeed, been an opportunity of comparing the heads of the Assam and Bengal forms.

but I cannot regard the alleged longer muzzle of the former as not an individual variation. There is, indeed, one specimen of *Cha* which has a longer muzzle than the other specimens!

In the face, however, the resemblance of the two specimens, both to Mr. Boulenger's description of *Cha*, is so marked that the variation which cannot be regarded as of more than a slight importance, although, as will be shown below, it appears to be of comparatively common occurrence. The result of this comparison is to show that the head of *Cha* is specifically separable from the tortoise.

(a. *Cha* is specifically separable from the tortoise. The result of this comparison is to show that the head of *Cha* is specifically separable from the tortoise.

(a.

» the generic position of *Cha* is form it will be evident

asional ligamentous unioi
importance from thi

.ith th.

f

Q in °
p.

720 (1879). <wd out *by* Bonlonger ' Catalogue,'

f



Mils, *B.* D
M of the plastron of the same

fekker-

nate group by TV, *annulaia*. In respect of coloration } strictly comparable with *N. trijuga*, and especially with the v. *thm* and *edeniana*, in which the car h more distinctly yellow carinae; but the uniformly ye! distinctive of the present form, which may he define *Caraj*

or margin, and

tricarinate.

broad as, a ler than, I

and much

nud.al long

itely large; the width of the bri ibly etc posterior lule, -which is

little shorter than that h>

shield, notJuk'

dilU at ii fcrtesfciZi

and <necl

d a paler patch m

Lei >;\ce usually about, 13 to 14'5 i

HAD. Bengal anil A

^rcsont form is almost exclusively

of webbing in the i

P^{os^»!} carapace, which approx

lentous of the lr

P^{ac} rdnala is an interesting feat

\mi> nion between

ppro

rely ligi

be' the two lobes of the pla itself,

of this partial ligaraentous union in the prese

unent on the divisions of the T

nature of the anion between the campace and

been proposed by some writera, By all authors pre

ger, *Emys*, *C* and *Cyclemys* on the one hand and

Me other, had been approximated, or

system, ou the ground of the presence or absence of the p

uge.

* Dr Anderson gives the length of the shell of ii. metres but in the male it s only 13 centii.

K. Lydekker—*On the Tortoises described as Chaibassia.*

Having now sufficiently discussed the affinities of the recent form it remains to say a few words in regard to the fossil shell, of which a figure of the dorsal aspect is given in Fig. 2. The contour of the carapace is so essentially that of the recent form that there can be but little hesitation in referring the fossil specimen to the recent species. This conclusion is confirmed by the circumstance (which is allied to the fact that the hypoplastrals had

an intimate union with the carapace, as is shown by the smooth surface on the inner side of the inguinal **marginals**. The fossil shell is, however, decidedly larger than that of the existing race, its length when entire having been about 17 centimetres. The first and second vertebral shields are also relatively wider than in either of the existing examples; while all the vertebrala tend to assume a more decided balloon-shape in the fossil, which it may therei

be regarded as a distinct race under the name of *JV*:

v, siva-

The fossil specimen agrees with the ri

\ ample

in

total obliteration of all the sutures bet¹

of the ;e.

J;

¹ > TM_r.

is, from the Pliocene of **the**

size. The neural bones are restored in outline from *N. tnjwja*,

Having now sufficiently discussed the affinities of the recent form it remains to say a few words of the dorsal aspect is given essentially that of the recent in referring the fossil specimen conformed by the circumstance (which fossil was allied to the so-called *Chaibassia*) that the hypopharynx is a ligamentous union with the carapace, as is shown by the smooth surface on the inner side of the inguinal marginals. The fossil shell is, however, decidedly larger than that of the recent form when entire having been about 17 centimètres. The vertebral shields are also relatively wider than in either of the existing examples; while all the vertebrals tend to assume a more decided balloon-shape in the fossil, which it may therefore be convenient to regard as a distinct race under the name of *Nicoria tricarinata*, var. *sivalensis*. The fossil specimen agrees with the recent Sirgaja example in the total obliteration of all the sutures between the component bones of the carapace.



Fig. 2. Carapace of *Nicoria tricarinata*, var. *sivalensis*, from the Pliocene of the Sivalik Hills, $\frac{1}{2}$ nat. size. The neural bones are restored in outline from *N. trijuga*.

.)] E. Simon—*E'tu>*

euncfcia muticis. Vulvae ai*ea fulva, simplex, plana, postice
margiue transverso in media leviter augulato, limitata. Jnonsar, Siri,
50UO pieds, (*Oldham*).

■oies va oepbalotborace huraili, **pedibus** posticis **pai**
te. fere ut iu ge-

IB.

3. Ho MALATH ,v\

£ . Long. 5 mm.

Cephalo! <;oriaceas, crebre et longe albido-cinereo-pili
ipie Io bus, utrinque amp! 13, supra

Mius. Pil nmi fulvi. Pili clypci niv
clii

er ee *st*
idt
iatis
>, nigri

i vo-pni'

'turn **bini** max i I lares **pa**

Plaga vulva'

jtuso triqu

i&e< it aatici ta notata.

Jaousar, Siri, 5000 plods, (*Old!*)

p. 1827, Pl. VII, F.

dsj Siri, 5000 pieds, (*Oldha*)

\, Stoi J. A. S. B. XXXVIIT,]
Sim., Ann. (

<a, TLo \\xn. Gun.

nov.

I mm.

is et snl><imilis, tliiTort oi

iaf? mil

mtiois **inferno**

itum aculcatis), vulvae *u*

i, antioe stria ai-<

;t et **plagnlam**

rfescei

[ue **dilu-**

noe,

Ti)

inciso notata).—

fus'

scens. **Sternum]** :e fulvo-rufesceni
Jaonsnr, Kuin i: i (Oldha

iHAON- p. nov.

9 . Long. tot. 5 mra. Long, ficuti 8 5 ram-,
iialothorax ceo6, nitidus
rsim rugatus, orasse albido-pilosua, parti
e sulcata. Oouli niodii sulsequaJi:
hilio am loi itice quam po
'•us ocTilis mediis asticis BOH raulto :
latins quam I
uleis *Bex* armaimn, aculci.s lateralibus l
s, lateralibras S brevibus sed r *Umn*, ni
utia et leviter uucatis,

cenx valde atton <jue
iu me-

ilinariis impress am,
ividis, **vel** olivacottai <r zonie transve
rel Hnea i
iocoratnm. **Venter** sat crebre gin
fulvo-notatns, tuberculo medio to munitn.-
■ Hi, atmm, antice macula di! **parum** i
trasfci, obscure ferruginei, mctatarsis t
i-tlculis cunctiy snu; **fusoo-anni**
d^l. *ho* an,

pbaJothorax fere nt in femina sed fronts
iore i **eo retro-obliquo.** Scutum
abdommal

;tgis qaadi*atnm, supm atruni, ad *nv*
brovioi-ibus * et canefcis
r plica tranaversa elev:

longi' basin leTi
prope basin, aculeis binis breWbns sed ad
apicem aculeo eirnili ins tract a. Pc ! i,
atri, tarso supra, fernigieuo. **Jaonsar**, Tliai;

aide in sign is, aculeis lateralibu-
mere ;hnie distincta, eectiononi i
seusu sti rmans.

8, i.i

. sp. n>

9, Lo • mm.

ijialotlioi'ax brevis, o' inera
 fuscatus, parto thoracica valdo declivi tlica anface
 imata luvissime acclivi et crasse albo-setosa. Oculi medii
 asquales,
 vox subqndratam et subverfcicalem occupantes. Oculi
 quatuor
 visi) linoani loviter procuvvam formantes, Clypous altus
 oonlorniu mediorum panlo angustior. Abdomen breve, sub-
 od postice in tuberculum. ci-assum et obtuaiim. ele'vatum,
 postico uigricanti marginatitzn. Veuter nigrioans, ma
 i iis elongatda et atrinqae prope mumraillft rvo albidia
 , chelae, et pa iigi-cc. Pedes robusti,
 femoribns excepto, in IcaHs

t'uscis, patellis tibiisque aui
 nstruotis. Vulvse uncus

■ilcis pj
 crassus

. brevis, o.
 obtectum,

aa et obLnsoa, scapum ungue

la sulcata munitum,

imprimis &bdomiiH
 olorum

CYCL-

miter fuf-ico-pnnctatus,
 macula di! V-formanfco
 , parte tlhoracica ad marginem LnfoBcata. Oculi
 ti, antichi posticis plus dnplo majo:

ILJO oblongai ice acumiuatum et
 iu

tube

rertical vam, postice in {>■ Inm
 i obtnso mncmnam, pvoductun . tlbo-

Lvam, fuse ulattim ct ol ^men-

i.
 in-

Lbido-pi :is. Sternum pallido i'itscum,

i uotatnm, Pari •uli.s binis magni ila
 is ciielsBqui

■ vd interrupto, til unmllo
 t parum expn alo

ts, femoribua tibiisquo an^{as}
paacia breuibua
, .Vmi. Soc. Ent, Fr. 1884, p. 85

long . Vulva unous rnf d
 tuis, apic
 am convexum *ei*
 ;m, utrinque rotuudum, iucisura media
 itum. i? . Long. 5 ram.
 ph'&lothorax fusco-castanous, in rnedio longifcucl er
 dilul
 Uurucica latioro et ovata. A) a minns e
 asum liliud elevatum, postico breviter et
 Pedeb pa]Hdc lit! distinctius fusco me-
 txoe ftcul a Ji jm-ris paulo cnvssiore
 si me curvat-a et iufcns aculeis uigns, robusiis et •
 Ica-maxillares rufulo i
 carii
 inito.
 Jaonsar, *Th&dy&r* [B, (*Oldha*<
 \, sp. nov.
 • mm,
 lothor:. uaons snbingDr, regione
 VGX&, *nuloo* seniicirculari |
 rte thoracica fovea n parva Bed proftuida efc rotunda in:
 b(i ifcer ov; *o rotandam, pan! i m tub
 calls biuis obtusissimis, ad apicom inberculo majorc
 bifido, J tn, supra testaccuta, crobro fusco-^ ,lnij
 i albis bin m elongatis vittam dC
 utri: jectndtun mai tbiapfti¹
 nam fuscum, autice i ersa, utrinque maculis b^i
)iculi a I bid is Bubconflui mi. I¹
 , femoribus a< -ni fnsco-aimula(is, patellia
 sox d apico in ct in *tad*
 ■ice distinctiui^
 Jaonsar, I
 ■inis eed certc dist

11. BPEIBA CAULU, ep. i^

9 . Long. 6*5 mi

i'a?, "Walck., valde aiEnis et
 urn niediorum antico quam postico
 ediaa anticu evidentine majoribus, vnlvae cai-inis
adavia anth ■ ibus). C&L

!89.] E. Simon—*JS'ncle sur le\$ Arachn*

EPEIEA LAQLAIZEIJ E n, Ann. Soc. cut. Pr. 1877- p. 77.-
■\ Tborell, Rag. Mai. etc., ii, L873, p. 84. *Epeira*

Thoreli, **Hi, 1881, p. 119.**

■Toons; **adyar, 2500 pieds, (OMIiani),**

13. EPEIBA HIMALAYANA, sp, nov.

9 . Long. 7'5 ram.

halotborax pnHide luridus, lisevis, parco albo-pilosus.
Aro iloruni mediorum vis **longior** quam **latior** ufc antice quam postico
latior, iiedii **antici posticis** paulo minores. Oculi laterales a
medii

vguste eeparati, antious postico paulo
major anticis non multo latior.

¹levit< iupra **albo-opa** **ponctis**

aor et **ulrinque punctis** a*vis elongati

Le **oraatum, Bobtnas** lulvo-testaceuni e

confasiis quatuor, quadra him formantibns, notn'

Ste cbelffi, pediaque lurido-rufescenti bro^es et i

B **prdinariis** numerosia fulvis et j as arrnati.

s ot crassus, non multo \on aam latior, ;■

tenuatiisi sed obtusus et marginatu.s, fnlvus ot **saporne** veraim
ra-

ts.

a, 7700 pieds; Bajkoti |>iods; Kumia, 6

i is ct s i I area octilorum

oolis latt-i |iio **disjunctis,**

ab-

icJ'CI

o et]

t.'nlvU>

, oX

14, HA, sp. nov.

g. G mm.

ioi*ax(>) fulvus, ci*ass> , ilosug, paHo cephalica

e macula albida V-formanto i Oculi

ciroiter BBque latam cfc Ion gam, et antiee t|tuini

■ccupantes. Oculi laterales a ttiediis nou

er *He* angustisaime separati. I"

: tator. Abdomen circiCeil¹

leque longum ac la turn, is nigris

duro, { breviter atpnuatum

qaataor ts est E,

atque obtusum, ful-
aceo-punctatum, uti-inque vitta albidior sinuosa saepe
.ngt sco-marginata notatum, subtus fulvum, vitta media lata

,ulo i ore, atifū«te et param diatincte testaoeo-mav
Sternum eastaneum. Clisce obscure fulvae
a)

ileB, fulvi, fomoribus ad apieoT¹
que ad basin atquo ad apic* sisque ad apicem pallid
tie, aculcis pav acillimis fuacis, metatarsia, prffiserti)
cis. Vulvai uHcus sat bxovis et lafcos,
J tpra fulvus plauus et versim rn
iaiiuru, utriusque, secundum basin unci, subquadmftun,
Deota, 7700 pieds, f; E.
trignUaUi}, Tabr., ex Eui-opa, sat aflaaia.

15. I. .Lis, sp. TI

bborax obscure luridua, antice
sao albido-sotoaus, pavum con'vexus e
Ocali medii aream paulo longiorei
tice e vis angustioreni occnpam
3 sabaequalus efc G
ovatura, antico at I
stice 1*
olivace arte secunda vit;
foru 'rnatum, interdum latin
Venter taotpa graetp
utvinqo puncto albido tiotatuN. S a nigr
Pedes Bat longi, lurid i, fomoribuB ad api
medio atquo ad apicem fusco-ri- ati-anm
ftculeis ordinariis uigris, parnni UDCUS f
aetrus, apioe a
Jaonsar, Deota,
Bp u-lde

<? (pullns). 1

I
et Ion
iusca oculos liiiud
am arapl'rita, is. An
m latior, meti
Li qual
ran it a If ug quum
n.gum

fa ai inli-
 ter infuse: nanrmillis fui abatis. olse,
 res oi-is pedesquo omnino Ii Leia pedan "oak teiiui-
 ibidis et pelluecutibua. (Vulva hand
 adalta). Jaousar, Deikhura, &Qi
 L. chlorei, Sfl
 uen-
 ia differt i i sea to.

17. OEBCIDIA I , sp. n

Long. 4*5 mm.

lolhorax rdger, parte eopbalirVi dilutiore et rufesr
 longe ot crasse albido-aetu mata efc valdt- xa.
 Oouli uiedii aequi, aream subquadrata occup u!is
¹ icis cir luplo latior. nen late <•
 i antici. ia, ntri o sian
 >btu.st! cfr broviter tri urn, mucroao medio lateralibu
 ')jlauuin, dui'iusculi [tun, fp
 ■ imaritim, tub-
 tei taci lie-

■, roba Laridi,

aia crasuis,

) mi

lel um, anf
 i«, rutidus,
 fosco-ru
 Abdomen fere paral
 am, hand mt, am, duriusculuni ot
 ■x fu^co-tjlivaceu- fca media a!bida, in ru
 lineam mediam fnlvani ineludente, uotatum.
 Ven-
 ■oo-margiuatiis. Pedes luridi, confuse
 fosco-
 antici reliquis robustiorcs et evidentor
 rassali numeroso acuL
 3 et robusti, tarso insigni, euperue
 so et compresso producto.
 : Bujkoti. Ihain).

, Stoliczka, .T. A. S. B., XXXVIII,

adividua uiais toufi jcunes, ue qni

des

doutes aur leur d 'on.—Peut-otre faudraiUil lea i

ibridge dn nd.

Jaonsar, Deota, 7700 pieds; I
'ham);

Ijokhar, 0000

19, NEPITILA , Li, 1793, p,
ra Dtu pieds, (*Wood-Mason*).

20. MIAGRAJTM' NSA, Sp. liOV.

9 . Long. 10*5 mm.

Cephalothorax **luridus**, pilis pronis plumosis albidis sat di
is, muUo longior quam. latior, auti'

Hfiisim attenuatus, **supra** fere planu

siono arenafca notatus. Oenli Ion go am i sibi,
(mctlii lateralibns vix miuores), liceam recurvam £

iam a late^{i>}aHbu8 rnulto rem s. Abdomen p.
puboscens, supi-a linea media obscariore rnmosa nofcaUim,
subpamlleluni, antico recte sc

Ibido

Lei et post'

Laridi,

bus autiuis pareiasime et min

multo longiores efc robustif

tatarsisque leviter compres

iis plus di

violibus, paulo crassioribus < **parts** basali, tevector escavatis et

in

calamistro, di occupantp, munitis.

(pullus). Femina sn ia sod metatarso

claviformi Hdis regulariter instructo

Lro

ltnnito. Pedes-maxilla;

Hi) b<

Uucoixti

Jaonsar, Thadyar, 3500 pieds, (*Oldham*).

21. THI , sp. nov.

3 mm.

tlohoifi is, lajvis, nitidus, fusco-luteut

levi ■■!', paveissime albido- . Oeuli

bes, in linea sat proeurva. Oeuli postiti in linea pL

medii paulo mapres et a lateralibus quam inter s<

t mcc'ioruni ■ aei-longa ac lata et a

medii **antici** posticis miuores. Clypous vertical is, oculortrm

Abdomen magnum, globosum **Bed** ant ice obtusisaima et 1

nat bido-opacum, antioe macula media, ntrinq

posticc **ampliata, nigricautibaa** noLutum.

plieam epigav anctis binis par*
ruJf laavSj nitirlmxi, i
coxae posticse spatio articu)

m, Sternum fusco-
<■•> longe attenaatmn,
a. soso disfcfintes. Py
modici, antichi reli 10
antic's ad apice late

ulo hilvo¹.

ione oculoram.
■tboraco laevi et abdomiuc i

forma ab'
Cambr. (ex Yarkand), afiiao sed
nargiuato certe differfc.

22. CEDI
' . Long. 13 mm.

p. nov.

in j>arvi (lateraleg n

ores), medii a la i in
bus

des mi
imili.
ulis par via bi
le angal
nuitI'•<
Chcloe

IUfJu mi-

Ivo-
subgeminatis, in
-■ am.

; 'oscons nitidum.

nor,

icia

! secuuda plagnlam

◇minis ;li, affinis,

ili. av-

p. nov.

da. Oculi postici sequi a sese lute et fore axjue
luteosericeis striu brevi sed
disf Oculi
ittiis diainetro oculi angustioribus a sese se-

SBBtns paulo dil¹

reum, pal lido *In*

isco-rufulfl ni

. ssd non genici

c□ Liaa • ■ ■ tlfcase s*

a longitudinal!

ieda, (*QUhcm*

nov.

ce pla_

• rioribus a

a paulo longi<

[. H. Auderaoi

XXL -

,-*. *—J

B. A..

(With Plates XIX—XXI.)

months I have devoted what little time I
to the study of R known to

for 111

Order 1. RTTTZOTA.

Fn Flosculariadas.

1. i, Ehr<

H. H. son —

ULATH, ,ATA] ,

Only seen once or **twice**

3' l'

Fairly common, on

l, Hudson,

^ during ^

4. FLOSCDLABIA IENI n Rn pi YTV

d with tl,

of i

^
* << <<

e of tho

•s.
TI

• he •

lobes seem in
posii

bale into,
the crop/and
the w.
tlit-re is a

Thi

th<<

ing

family II. MeUcertadk

5. MEI

•:■ *i*

::r:

I came across one specimen of n *u*
and breguur ,, aSfari^ ' "

disc lion in the cu^ beneath du.
ature.

extremely cuininon and of tun oc asters.

7. LIMNIAri

I have only come across this species once, i er taken from
a
irulah in my orchid house, but on that occasion I found ci-
aicn
On the same date, January 21st; 188' same water, I found
lembling from it in 1
ere not

the in

8. OEPHALOSIPHON L\

were seen, December 1888, but it is far from
Qtally tanks.

XX, Fig. 2.

very small corona, the
. The chin is
ath bei

ie corona The cilia of the sc

andst in thaj
ich they are situated is very clear
below the lowest point of the wreath ;
nya?, which arn very short i .conapi;
with difficult from (!.

■ch, a^

les on. the dorst
at the bottom of Uu
and. and <.lear.

ly is g ;t*, soi]. 'que, f*r w. OTi
is op;> i
is

Q with difficulty. The cloacal aperture is **situated** half way doi

rwra-

jec: i
i ich have 1 p of the tube.
jⁱ ength of the boil

v/heu full kld. The tub<
jrtion is gent ^ freely and

Tn li

sharp taps on the glass slip or to movements of it. It r. .
but the foob is c<

a no ha

(*Eohisies* in th ness of the corona, the
the ventral antennee,

'1'

T

ctrmnv

h
e

considerable in
which the peai*ance

of si c

m
u
l
e

4' the

bod ;

Hudson h

my ov

i

o
f

irently o

t
h
i
s

v it could be seen hort spines or projec

■y pressure

were !

s
p

?pe. Some specimei ill
gn

e
c
i
e
s

a*eat a to

div*

); them

ma *iovr* p<

The so-c
direct illumination

h
a
a

■ are in most cases granulated in struct i

r spaces, sometimes two or more clear spaces iu on

aver 8-JCU British specimens I whether fchii

n
o

I tiud no mention of it either in Pritchard or in Hud

t, T beli met with several specimens in the month

n. ii.

in of clr :he female, but I **did** not see
 n amount of resemblance *to* the male of
 ouce being the presence of a 'fge, clear,
 lated in f, erni .sac which hail all the ap-
 i conti vesicle, though I did not see any *c*< ion.
 body ie cylindrical with a foot pro;
 y large ; the large u
 otnd *om*
 p of the con tin dele. piment,
 ance i; e.
 There is a regular network of niy
rroundinj? the

Order II. BDELLOID. [I.

Philodinadae.

T1 1 different Bp but hi

which I feel at mt of >

11. **PHILODIKA** ubt
on

na.

. 4.

here are finn **hair-lil**
our is not pal root "
 pron
The antenna ia long and straight. The iion
rked,
 alivar cry no It is
 •>t always attached to the **stems** of ' la,
Eary life, for I Jtav
 ,tion for **hours** without their moving from their
 m of the to which they
 sbrnb ' I, as soon

tached on each side of
 the
 d some ce than two.

ir-like are variable both in length and poi

i, the whole *i* >.
 Thi
 fao ;s to me to *go* far towards provn
 to live in ft tube, though, v
 other creator !«

,MURUS --, Pl. XX, Figa. 6 & 0, a.
 Though iU;Tering in some particulars from the diagnosis of
 f

in Hudson and Gosse's book, ifc can belong to no othet
 me length and tenuity of form, i nts of the long ant
 totter without sens o oi
 ■intal column; the I

Bat in com fraction tho shiv
 Clio joints of the foot fit into one another and may be
 si" right into the bod; causing it *
 :'con lessened in i and increi
 lost globular in ali;ij)o. In this it resem!
 Ti; other known species of
 in this the

:<med i
 to body, whit . klei
 posterior] dorsally ' at tin
 indei aa it is at the 1 . shows that
 the nock to near the
 It suddenly falls to tho foot. Th<
 t but bulges slightly. Wh
 t of *i* inos its breadth, in

■Uc small, near the summit of the front;
 all, cm ly protruded, and in constant motion.
 The

>m tho corona, aud has two gastric glands fairly
 The digestive canal is perfectly ht when the crea-
 ■d, and there is a clear distinction be? the
 mtostine. The cloaca is situated at the

small,
 1. Tho surf the body is d
 !cimena y tran
 be distinguished. These do not n

luu
out tho vascula

.linens there were living

in the con-

their parent bheyani
 fch of f ttor, and the
 mov rat, now drawn back into tho body,
 cou; length Tlio
 one instam
 The I !rimn v i fully is tipped with
 ons, though, thai
 Tlic I. under diffeient ci
 As usii [y or swirai
 over the km I]
 I
 arrangeny a high
 pov. speak with some \v
 Tin noticed in on i on one
 others also with a l
 observed the same. In ol
 teotb on both rami. In *Phi*
 knu Cut in
 tooth, with the mini .ing]
 lo not think I ca s,ken.
 size of an od is
 of which the l L the f
)ody at its *vri*)
 ," long by consid

Order III. PLOTMA.

Sub-order ILLORICATA.

Family X. **Notommatada.**

17. NOTOMMATA AN 3ATA, Ehreni

aeen, December 1-lth, 1888. Not

uncommon.

18. N"i ;

H¹ iborg.
or from the i

The first s en I saw had toes very longer the bo
:her i obtained from ▶otaueal

21. Di

iiion.

der Li

Xi

■OJtl.

lily XII Dinochait

a. In

XX, Fig, 7.

.ul. The lorica

i

seruir

, but dtffi

h in tin.'

1 Salpinada.

Lgnishing between tl

this family, as ■

Is v

2G. SALPTNA EUSTALA, GOS^

Not Tmeommon. In alvine spines
it one the lumbar spiue was irregular in
pearance, and th a above the pectoral s[
less Uan ub

•hies, I.

"ea in

; wox-k in>

examined B

A four betwei
and
i obvione distiuciioi: b Bpecimons w link this
mi a t Π*

^ureo!
wl us. The shell is narrow
no bnlge'on ^cejus*
berg's figure has not these cham of
distinctiun is that the lumbar spine is a
for in some it is as long as in

n 8. I
.ud 8. bre ander tho micro
lught t¹

'not usually as long, the}* av

s.

id. 11 y common

IV. Kucblanidse.

"OHLANI5 u

Elirenberfj.

Ifc **may** be

it. A. few n. i

bad gone, t!

e or cover glass to account for this loss. If broken off

they

ikon **by** the creature itself as it swam about; it had
) Rwim in.

Family XV, Cathypnidae.

30. OATHJTNA

common.

31.

i

uberg.

specini ei

: iik on

the malic

two wavy, the horns i

In a ;inen kill'

ventral p] vere very distinct **and** v,

■th of lorii **I lengtl**

BDLLA, Gossei

XVI. Coluridse.

a was

the British

'anger in proj

!■

\ T.EPADKLLA, **Ehrenberg.**

he
on
e
dr
aw
n
by
m
o

oly

Gosae.

' bee

■», teeming i_u
and in which Pa

Common.

3S" J M*TM sp.,P].XXi

» very slight, except appearance of a col I sferisfcic td the author open from v ;

" the 3

J" than t and in : B Of tl

3i_ &» *. «P, PL.XXI, Fig 10
pretty

one, A" b man angular poi; hiudercorve r7 evident, as ««

■e seen in active operati
«t possibly the species iB not a
«U and inconi Length of i

lyXVII. Pterodinadae.

iA, n. sp., Pl. XX \
inflexible, nearly cxrcule

^s« ' occurs in /
diBtincfe and regular pr, a. Tho ,
Lble though not c<; The

Thepecu] 41, PTERODINA, n. sp,
onespeoin* of this species (?)> its ini

i—A'

ke to be a co

no a

beb.

ar-

rangem<

the fo

[e and
is not really a species, its ii I

most curiously from the type i'onn,

Family XVIII. Brachionidae.

es drawn by < ind
ly small, are of common occurrence,
spine?— 11 from
itral occipital spin) ost
>oing very distinct aud

(he ini

'literal E

»n.

VAEIS.

n

XI, Fig. 1_ fn

a

iens the foot is of; ;
lotion

tculare. 'i are

\t tho loriea appears roun

the oi

ozcepi

d &rther forward than tho dor
loriea, and a side * IOWS that the dorsal edge of
that the shell from tins ed 'Iiospi
nes and B being having an
outward en

PL XXI. 13.

of those havi

am from I The lai large rounded
papillae rather than

47.

PLANII
i

EI PLA

PLA

. The SL; 190. he
K 50.

dition **ftov**
x 1(XJ.

11 VI I

Fig. 7.

-80.

PLATE XXI.

. Another sp

PLATE

os and I
lorsal view,
100.

be same,

diff. 12. Jj

■ta.

i, n

■⁷s for aJ Malayan- Peninsula.
B., LL. D., F. I u S., B lent of the 11

[fi* md read July 3

As the Calcutta Herbarium contains a rich 'ayati
darts, 1 pi lish from tin. me a
many - idigenous to British pr
under **Bril** luence. i fco the statr **mainland of**
ehinsuli ie provinces include the islands of
por Penang, **and** the Nicobar and Andaman groups. •
h I pr to follow i of the late Mr. I
imand It is unlikely that i scanty l
nder several **yea** compi
' the Flora of which ■astain
ill be **taken up nearly**
in ■if Benthara and li

.11

I. '1

ro, Cap} come
between Mn
xtent and di , I ha i obliged to post}
E farther herbar

>on be

it I. i ACE,

ce.

IOUH,

valvaie. **Petals 0 o**
iuto or defurmeu. JS^v
ally.. **OarpeU nsoally** mi
ovnle on< I he venire

!!"h fl i:

: **aohenes, or many-se a b**

ryo minnt

d cold genera 30 ; kno

■ ily om

tavo

i

plants I ig bo ono or two of the other
trii



Long-bearded style,—Distrib. *es.*
 11. Cat. Young labrous.
 tldly ovate, Bhortly acuminate, em I in,
 3 in. *hw* \^Tes, *m*
 linear, ■frhitish green. idi'ic, glabroi;
 Ind. i. PL
 ■ all.
 . I, 1.
 t thg whole Indo-llalayan □ to the Philip-

DEE II. DILLENACE.

Trees, shrub , sometimea - ig. *Learns* alternate, sim-
 tootUeu (piunatipartite in bipulate with
 ioles, or more rarely ysttt* ms stipu!
 How or white, Of pei*sistent.
 ynoas, many-or
 tenninal poreas. *Car*;
 net; ov
 try or few , or many and attached to
Fruit oE fullicl ad sub-baccate.
 it late, testa c: <.pbe short, albumen
 o uiinutoj nui:fc the hilum.—Distrib. CJ

-i tbickcued *up* wards ; anthers short,

... 1

it. *Bil* ... ats not thickened upwards;
 ant!

Us.

lif^bs; leaves all
 g arillato ... 4-
*Worn****.
 ■ reds not arill; ... o, *Dillen*

1. DJ Linn.

ned. s man

[^]epaU 5.

Is muc

. *Ovary* soH-

tiai-rov o a subulate style; > 3, aso-

■ L[^]euoa, 1-seedcd. *Seed* with a cupul

D. ARMENTOSA, LIUJ

idly lanceolate, ol

^ed pilose; both **frarfac** > 11

pai

prominent: length

in., bread*

diam., iu tomentose or

ing

hat art

leafy

ih re Hexed.

DC. Prod. i.

lad. I, 81, D

a. 812.

at glabrous.

fruit hairy. D. I

s 70

. Ic. St.¹

V^rall. C

13. I>

13. L!

liptic, acute, entire, I

e caneate or round-

iclingj prominent; upper surface fimootb, sbinin

alous ; neither of them ecabrid ; lem

a -8 in., broad.

in. in d

ie leaves. *Sepals*

ix

Malacca, MaLagay No. L0

lected

2. T

*

Climbing shrubs o>'

. smooth, scabrid,

or pul

ile

parallel lateral veina.

Flower" in terminal

ral

pi

maphrodite or partially 1-sexual. *Sepals* 4t to 6, spread! i

vm many, filaments dilated upwards, anther-e 3

to 5 ; ovules many, 2-seriate. *Follicles* o

tlmbriated or tootL

—Bistj H

trox)ical

-15.

1. T. ABSA. DC. Prod. i. 68, **YoUng** branches s

8ul)-strigoso. Leaves 2 to 5 in. long, ov toeolate, acun

3inuate or

rlabrousc*

termin

than tne **leave**

seeded.

W. and A. Pi

Haask. PI. Rar. Ja

Th, PI. Tn

k, Gl. FL B. Ind. I.

Common throughout Ii laya, at low elevations.

2. T. EDRTAKDBA, Vahl. Symb. Hi, 71. Young brn

if 2 to 4 in. long, oblong or obovate-oblong
: *def* above glabrous except the midrib, beneath
oung. *Pa* terminal and axillary, sheath*

several-seeded. DC. Prod. I, (38: Rosb,
 PL i-6; H. f. efc Th. FL Ind. i\ 63; Hook. 61. PI. Br. Iud.
 li, 8. 3
 its Settlement vations. Distrib. Moluccas and J

IOEOPHYLLA, Wall. Cat. 6628. Young branches pnbesc
Leaves broadly el afe-eJlij>tic, 5 to 7 in. long, margin aub-sin-
 both s¹ terminal^ longer than the leaves,
 I, not ribbed. . 1-sccdetl.
 fil. et. Th. PI. Ind. I, loolv. fil. PL Br. Iud. I, 32 ; Miq. FL I
 .1. 1, pt. ii, 8.

■ments, in tropical forests. Distrib. Sumatra.
 ing, n, sp. A large *U* 'tranches and
 oenee shortly velvety-ti tse. *Leaves* 1; ceous, broad-
 ly slightly obovaie, the ape minui
 obscurely crenate or undulate io ■
 iu-ved when dry ; the base rouudod ov slightly
 per su; lower minutely nerves st<
 fcenfc; length of blade 8 to width
 ..: about •nee in lit ted, lai
 minal panicles or more long.
 lly ova '-acute, concave, ciwberi
 long. iiboufc as long fi
 lender i ak.
 9**Qb**.
 d by ai to be a very large tree.

3. ACHOTREJIA, Jack.

mlcsc herbs with woody rhizomes. *Leaves* large,
 par-ved, with sheathing deciduous stipules - pe short
 axillary,
 <?ers large, yellow. *Sepals* 5. 1
 .crous, in 3 bundles which alternate with the car filiform,
 nthe . LU longitudinal porou co. *OQ* ro-
 te, recurved ; ovules 2 or more. *Fruit* of 3 irrou
 .Hides. <branous aril ,
 uch 8 arc endemic in Ceylon,
 an.
 f.oo)c. Misc. ii, 82. W] s
 or golden hairs, especially when yoin;
 iliafcoj the b;i ed, sagiti
 blotched with white, petiole short, *fiaceviet*

I Flora

h in diam.

J. Ind.

1. Fl. Br. Ind. I.

, 0. A.

L6:A.

damp shady spots at clevai

0 to

4. V

?rees, sometimes lofty; or shrubs al uervea
majay, strong, parallel j petioles usually shir wiugs.

Petals

liuear, erect, cc!

in -the a?-

timer©;

, and one in }

Blurae (genus). Inner row o
iud arching over tli

1. W. HUFFRUTICGSA, G otul, iv. 7G(i
A

small tree. 1

adly elliptic or sab-obovato-ellipiic, bin

I a ons except ike \m\xs of nerves wiion

: length of blade 7

•T about as long as the leaves, 1

in. long. *Flowers* 3 to 4 in. in diam., 3*ellow.

Igli; *Petals* obovate, creuulate. <

BL] *ixeelvt*, H. f. and Th, d. I, .

k). H^r, *u bsessilis*, Miq. Fl. ID d. Bat. S u pp 1. \. Ann.

5, t. 9.

Malacca, Singapore

Sumatra, Banka,

Borneo

bably to i ■ of the >elago.

W. OB LONG A, Wall. A tree. Young br

tomentose, the old "glabrous. / tlior d or

nelled (not winged) peti>

entire or bly serrate or sub-serrate, nev

blade 6 to 8 in., breadth 3 in .; petiole 1*5 in.

leaf opposed, few-flowered, sborter than the leaves, 1.1

about hickened above, tomeutos*'

ovate-rotund, tomentose externally. *Pefah* ol

Q. H. i & Th. Fl. Ind. i, 67: H

i,3i 't. Vol. 1, pt.u, p. 11.

■aits **Settlements in** more or 1

II. *I* Filaments all erect and nearly equal
in

3. *W* rELLA, Jft< [. Misc. ex. Hooi ip. Bot I,

S obovato or obovate-oblong, obtu use,
as, glabrous ; nerves 5 to 7 pairs ;

» t in.,

I, 2 in. in <

us. *I* ivate. ;it

with pal] i. H. f. and Tfa. FL Ind. I, \$\$: Hook.

Ir. 1- hid. Bat. Vol. I, Pt. ii. p.

Perak and Malacca; at elevations under 1,000 if,. Distrib.

Su-

W. M v, King, n. sp. A small (oung p

id leaf-ptstioles sol*' ivouw-tomentc- *i*.

net y bmnches, coriaceous, obovate-l;uic. oi

ite, entire or minutely »«O

,*t the *14i* to 1

it.h 3 iolo about 1 ii

:• tomentose] te cynics ;

peduncles I in. long.

i* Joseph Hooker who had"

h.

jet. B

■ob-

; tho nnder

on tli.

readth 2 to 3

anute-
m the uodor
f in a tuft of

■ o-

, slightly hairy. *Ovaries* ;

Perak. 1

ly by Scorteohini vvbo e name TP
 spc & Gandichaud, 1 have rechristene
 discoverer. In bis desc ■■ Scorteehini
 ■ned many buds, he never • Ind an,
 this agrees with the En >n of
 reji tula and not a I) oartnot be settled until ripe fvuv
 found.

Species of which flowers a

6. W. KUNBTLERI, King, n. ep.
 scent. Leave lus, obovate-'
 owed, slightly sinual
 and 18 to 22 pairs of nerves : length of £
 le nearly 2 Lu. I
 b 1 in. broadly ovate, glut

rak. King's collector N"o. Tbo
 iruit,

., Linn.

Characters of *Wo*

lomore*

■. white ; ■
 . er dehiscent, cohore in th ftcci-escunf
 calyx; i^hile the seeds are c:
 1, **D** v, **Linn.** A tree: tho young branch
Leaves or at the enda of the brant
 ovate-lanceolate ply serrate, glabrous
 lly on t
 breadth 3 to 4 in 5 in., channel]
 . in diam., BO
 2 to 3 Ln. lung.
 <tng, uudnlat s long' n tbo
 over them. '; the sti:
Cmi ith many reniform hr:
 XV. 1.1 and Th. Fl. Tnd. I. 69, 1
 isia [IT, 154. *speciosa*, Thunbg, Linn. ¶1
 D. Ind.ii(65
 1.; W.&A. 1 , Vol. I, Pt. ii, 11. C
 Tropioal I

L, Wall. A treo> tlie brand
 ly tonientoso- *Lea* **riaceons**, ovato or uijo\

aci!

sub-en t

(-horizontal pi

lScoos ..th; bl i to 7 ii by 2'75 to 3-5 in.

1 in. tomentose. *Flou* va. in i

t, tomentose, 2*5 in. 1< 1, ovato, c

thick, minutely a osein i aally, thr.

and inner surface ,', yellow, veined.

H. f. and Th. Fl. Ind. I, 70; Hook. Ii].

£nd. I, 36 : Miq. Fl. Ind. Bat. Vol. 1, Pt. ii, i:>.

uid Perak. In tropical forests. I have seen no ripe fruit
of this, nor have I found any description

ivefore unable to say whether the sepals

and

are those oi

ar *D. a*

doles are much laxe

3. *D. Ai*

A tree, the branch:

lick as ile finger, gla

s l'ufous-se rk

bovate, blunt o-

fc th -a of pubescent,

and*

i-Face softl;

Bheathing

iuort

;tu. ;|>

in. or ii

cent externally

whel , vein-

heu old ■.

■ a I!

>k. fil.

Miq. PI. [nd. Bat. V...1,

i > .

r. l,

∴ iv, 703.

Oolbertic

■\v elevatii.

vs., King, n. sp. A 1;

ory coria-

ientate; t' truncate, *■

he impressed midrib and aorves, wln'ch
under surface pubescent, the midrib and nerves
ver

iolar ; ; i

in. Ion .

:ias liuear, radiating) ovules ex-arillal

i'ak, Father **Scortechini**.
 is unknown and it may be
 "Hate. It has, however, the facies of a J■'
raia. In leaf this resembles /
 res mnch more nan-owed to the bnse. It a
folia. Wall., but is di- jei* nerves **and**
 iav ret-ⁱ ms.

iy kncr 5. D.
 GBANDIPOLIA, **Wall.** *Leavr*
 ibove, tomentose beneatli; nerves
 ugh of blade 21 in., **bra**
 ■asely tomeutose as is tb ib. ET. f. & Th. PL Iu-1. I, 7J; 11<

Known only by a few im]
 ■m Sumatra, is a species also ki
 cimens which I have tied. The two di
 fcd D oug to

iiar m -lives al
 fcipnlate pi not. try and 1 tea showy, whi
 as, an-' -rls of 3.
 film :eto, free or)

• on the •ous or ampliitrnpons. or of wundy
 dehiscent ca solitary or few, SOT
 and c:
 y and oily; embryo minute, cot;
 blunt, nest the hilum.—**Dietrib.**
 Chit*

perate i0:i~ mountains and United States, a
 species about 80.

Tribe I. 3 *Flowers* bisexual. Erect slir
 s conspicuous, convolute and embracing the
pets on an elongatod axis.

la not separating from the carpophore;

ore se> -ked.
 ... 1. *Ma*
 ,, ovoid, ovule ... 2. *Many.*
 Car **ire** stalked, cri -i-nt ... 3. *Mic*
 ■ **separating Item Lhe fl**
Etnd dehiscing ventrally ... *i. Tala*
 ■ wersti- bwe^aaL Shrubs
ipules 0. Carpels ra
1? lowers unisbxua] Dli
 mb-abs. Leaves **extstipulate.**
to 0. *Kadsu.*
 1, MAGXOLIA, Linn.
 Ti-; -. *Leitr<>\$ evergreen 0¹*

t> to i
eunents anthera adoate, introrse. Qy.
oelt many, iml
ti-al suture. axis, \
 adnato **1-2 lally dehiscin** du-
 om Lhe carpels^ 5y a long cord; outer **ihy •**
 alb-. **ily.—i ■** ■- N. A
 Jaj **it L6.**
 IX. MAI.VGA*. *a. sp. A tree* lies an
 pale ; raombi
 B roui.
 >wer glaucous, the mi
 i 8 iu., breadth 2
 Jole'B'in. **terminal, solitary, shortly** pedunculate,
 buds
 >d villous like the pedicel.
 shape as tho sepals bu.t **smaller, yellowish-**
 \s villoiTS, [jo...
 . long by '6 iu. diam.; iLe individual carpels ovoid, not beaked,
 illous.
 . 17), Perak, Penanf,*; in ' \|n

, Blame.
lia, 8
ns very ifce;
Gynophore sessile. (
leriug in au ovoid headj ta decuireut **on** the ventral sui

■•a of the JJ

trpels persist*

,lly.

Mountains of tv«

Ann. Iragd. Bat. IV, 71.

dull

in
aud tip;

bark; young tawny villous
mucous, obi01

much a

bull

t

es 14 to 20 pair

li of blade 1!

7 in., petiole 1 i

villous pedn

iioid h

1 petal

from obovato to ob

y contracted i

.el) oblong,

■: aboiv

onl;

Tli

imene collected by fcl

rare i\`ithoir

?hey

8 Sumatran speciuiena on

i. TX_Mli9. A

a and petals 9_T greenish-yellow, oblong.

glabrous. /

fleshy

Bijdr.8; Fl.

,1. I, (

rib. J;i

3. SCOUTKCHI

sp. A tree. -The

stipules and ui irfaces of ^be leaves nrri

heaves thinly

coi'iaceon;-subacute;

upper surfa>

nerves about. 12

.1*25 in., pel-

IS: sti]

in, long, lineai

bvo

in. long) on a si

G to 8.

her Scortechini.

Tliu ouly speciuiuus of fchi

e anripe fruit. The

The

only 1 ovule, I 'y it is a *Kanr/li* 1 I pnt it into this gx
mally. The small ruions leaves, shining on the upp^r su
and small axillary flowers mark it as distinct 'from, any other
Indo-n *Magnoliad.*

3. MrCHELiA, Linn.

Trees. *Leaves* as in *Magnolia.* *Flow.* . solitary or
ual, and petals similar, 9 to 15 or mi
■ stalked.

Carj

decurren: more.
spike of coriaceous dorsally dehiscent- carpei of *M* a.—
Distrib. at 15 species; temp, and trop. I of
^r Inei

SIPAOA, Linn. A tall tree, the branchlets
pubesc

. ovate-lanceolate, acuminate, abrup
, shining a nd glabrous or pubeml
thin, 1*2 to TO pairs; length of 1 adth
; petiole 1 to 1*5 in. *Flow-* , solitary, axillary or
kl, Bhortly pedunculate; 'o stipular *fa*
gilky. blong. about 15, *nu* oblong, 1 i
in. long: indivl ovoid, lentic

W. So : t^Lj

[11. i, 13; Blume Fl. Jav. *M.TJW* . 7 ; H. f. & '
PI. Dr. Ind. I, Vol. 1
DC. 1. J;JUT.J m. ex DC. 1. c.;
t. 3 ; if. *aurantiaca*, Wall. C
Wight 111. i/14, t. 5,f. *pub**
:
-*I'll*, p. 14, t. 4.
rate forests in, the Straits Settlements, but not common.

I. in Verh. Bat. Gen. IX, p. 153. A glabrous tree.
thinly coriaceous, shin <ovate or obovato-rotund, shortly and
picalate, rather suddenly narrowed to t BS 1" to 1^
, ti ling; length of blade G-7'5 in., li about 4
i . 1*5 in. in. diam., s
pedancles about *o in. long. Bads cjlrn
,als about 8, oblanc or lanceolate. to 4.
1 "5 in. long, the walls i Late,
7, PI. Jav p. 15,

1. Ind. Hut, \
, at low (.1

the mo 8, Distrib. E

llima

obovato leaves, and ml

flower iger peduncles : but in other respects they agi
•• Java plant. This species is readily distinguished by its enormoi
.;e, solitary, woody carpels.

Juss.

:es or shrubs. L> inflorescence of
'etals 6 or moi 2 or more ery numorou-
ithers linear, iutororso. G-ij re sessile. Qvari<
finit .ed or capitate : stigmas decurront. Gar-pds

woody,

separating from the woody axis at the ventral suture, an

the seeds suspended from the axis by an

of Mag- ^>istrib. Tropics of Eastern Ama, & South America : Japan.

Species about 18.

1. i, Hook. fil. & Tli.F1. BP. In.,1. 1,4
Young lea \ thes, the pedancli the
iikir inroluci ing the caly.\
tomeir Leaves su.b- ous, oblong or ot
and shortly ac o- base, whe;
glabrous except on the low tbe midri
J in., brr

ovate, tomentose at the very
id; II ^tki glabvescent when quite rij

; Porak and Mai

his T Bl. lad. Bat. Suppl
and, if

s and this

mtical, Miquol'a name, dating 18G0, must tak-.'s,
which was public

2. T. AND: f, n, sp. A glabrous shrub i
tves sub-coriaceous, ol late-oblong, rarely Ian
(usaally rather abruptly) to the
both surfaces shin es 10 fco 14 p
below; length, of blade 7 I
in., ex; at the base. - .. lc
on thick terminal aus pupt
■1 of caly)†. 3, V

ciform, 15 in. 1 I he ind

y as bv in. Jo

Andaman t Harriet.

small In leaf tli: \. f. and

(lowers and fruit. Tho individual carpels of£

the size of

1 inch Ion cowlv oblong and not rho 1.

"dng—: -Is for,-

3.

T. B1. *fl* i.
urub. 10, 11, 12, A

I G blong-lanceolate, acute
uous, eliitiicg on both surfaces ; ne<
of blad 8 in., breadth 2"25 to 2
minutely muriculatc when dry-cm irial, on aimnl
;pnlar hood

'her end, *slight*

roui rosy green to i\ brown. *I* 'id,
in, long-, pul at first, uj;
lomboid, L recurved beaks "75 *i* in.

1 Tli. Fl. **Ind.** I.

q. PI. Ind, Bat. Vol. I, pt.
Ma

BL).

, in shady damp *i*

e shrub of which B hee 3

o seen fr<

t.hers describe t] as often j>u!

pile

4. w.
T. K.

^
:o and in

i'igh; gla!

nly coriaceon-

■kened, /

ei-ect

1 in. Ion rr.

(J scarce I\

ily elliptic, flushy, glai

an '5 *i*; i7* 6 to 8, line

MI. ;

individuf

in. long, with short *sU* -termii

at elevations of from 3." »00

feet.

i I

TAJ

in a description of a new-sped us

fiEtiJi. Kinir, n. sp. A small tree or **ah jlabi**

I villose. *Leaves* oblong-lan<

tb at *i*

D **and** shining on both sar-

ih of blade 4 :it.,

?5 in. l'

ugojsc.

bort terminal beak.

i in. lung, the base compressed.

'ir<

ialayan

Sumatra, on

tk **etc.** at elevations of

. but its ;

icous I

I they I

7's are small

►fcobovo

els are only ai

half tho length <

e of that species.

ILLICIAM, LIB

Evergreen aromatic &

or small ti-6fl«

7

bed. *Flowers*

rJi

V6*

«

III



^e,l-ov

1

^d follicle



fefc coni

o-r,;

iiinffin

blunt

be,

Perak, **in dense** forests at olevai

There is **some.**, ;ty ns to tho ,,

sometimes they « «

oth, **iiimena** tUoy resemble the ■

- vary in nmber, but th -

of the loave₈ in *I*

m other, **almost ooriaoeon**

. ia p[1.

t!

inolded

P

. T'

"ST. •>• sp.

A small **gj»broi**

opposite or i,, whorls of 3 oblanc(J,.

HM

,n abrupt blunt ,ho,

,luul_b- narrowed to th,) i

length of

o 8, connate ; petals of <? 4 to :-
2 1. anthers sessile on a central column ... 12.
Tiibe IV*. i uerous.

; or ini! iedons thick fleshy. ***
iiS 4 or 8 13. A.

1. Mi

in axillary or terminal i
--seriate, inner larger me ■
filaments free, the tip's thi ig
oblique'

(ermii. p rugose, dorsallj
ooved venferally or curved round
the ily rum in
i bout 8, tropic

n.
1. -; Contrib. Ill, 34. Young- s]

"15 in. 1< annlate, green.

ic-oblong, pule j>
or less, llook. 61. VI. B. Ind. I,
PL Ind. i pt. i, 7S; Kurz For. Plor.
I

tub- L. At I. Ind.
it Ca
"

IGti. lus B\ Bijd. 25.
B.

In nil tho provinces, but appai'ently not am

on.

lago: ■ '1 British Imh
Jliorn ContriH 35. A' \
k bearing many

bran

. romotf, ovate or o v
entire, the bjfe cordate 5-ner onation prom

of 1 in., brew# 1 iin.: petiole slender.

1 to 2 i! der, axillary, \
i in T.

rely Barmenti ;ubs. alternate
Flowers small 01
 led 3-
 cymose or r:
 (rarely 1 to 4, or y free, imbricate
 ios, outer often minute. *Petat* or 1 to 5), fVee or
rs. Btm ;iypogynous, nsm ach
 ..tal, filaments frec orcoi: inthers free or connate, 2-oelli
 2 *Flowers: stavnrwcles* C or 0. 0
 12) ; atyle terminal, simple or divided ; ovules solitar
 isnally amphitropotiBt *Jiipe cu* drapaot
 nal, or by excentric growth snbbasal.
I or reniform, often curved ro; *Iniru*
 s), albnmen even or nmiiuate oi
 y, a]>pressed or spreading.—A la
 leeies about U
 ■aerons. 0 ttsually 3. T>
 ;tral or snl olona
 albumen copious or scanty tall
 diug 1 y.
 1 or subtermii
 0; filaments free DVrtpea ... 3. *fflfa*
 with a Bubbasal ... 4. A ...
 i-ee
 us. *Ovari*
Seed horse-shoe shaped,
 ion 'er, cot\ a linear or slightly dilated.
 ! imbricate ; petals 4 to'6, stamens
 ovarfes 3 to 6, Btype canaliculuie sub-
 -lobed -.• ■*
 ivatc; petals ;j or
 ied 7.
 :!» to f» ;
 ...
 ■nierons. i
 sarp dorsally nan
 -shoe-shaped, albnli linear,

Mi Maingay. Distrib. Java and Borneo,
A species of which I have seen no good specimen. The *Somgoh*
fcion is chiefly copied from Hiers. j^

4. TrxoMiscnJM, Miers.

A scandent shrub., juice milky. *FI* acemod *pah* 9, wit
Us t>, oblong", margins incurved. *M*
mta flattened ters oblong, adnato, bu;
unknown. *Drupes* mil

'Diong, style-scar terminal; endocarp mnch compressed, dor
cor y flat or ly concave, not; mtrdd
flat, oblong; cotyledons quite flat, nearly as broad as thi albumen,
very thin, cloaoly appressed; radicle short cylmdric.—} >

3.

Miers Contrib. iii, 45, t.,: ?ng shoots
and

3 of inflorescence brown-tomentose : bark of older brand: ly
, palu brown, deeply etriate, very sparsely verrnco^'
ran*, -oblong, or shortly and
suddenly

. the base rondded or truncate, . the
nerves

■scout and 2 of them small j'len in.,

1**0 in.; petiole 2 to 5 in., slender. - [ate on

4 to 8-in. or eveA 12 in., long. . in

ilana. *Drupe* elongate . compressed, V2^ in.

lor i in. broad ; endocarp rugose, woody. Miq. M. Ind. Bat.
i.

i.v>7. ■Straits Settlements.

Distrib. Sumatra,

ANAMIKTA, Miers.

rs in jianicles. *Sejmh* G, with 2 appressed
(*hers* sessile, on a stout column, 2-cell

7*

v. i- ; . *Fern*" *er: *stamlnodes* 9, clavate, 1-seu-iate.

•■-•,/. ■ n a shoi-t gyri"ii": "ii".- : stigma sub-oajritate. reflexed. *Drupes*
jihorc, obliquely ovoid, dorsally gibbous, style-scar sub-
irp woody globose, ombraL'ilig the fiub-globose hol-
idocarp j album on dense, of horny granules:
embryo .v, oblong, thin, spreading.

fc'lore Forest. Cochin Chine, t. 110, Gla-

:he jQuiigtrr bi-inches brown, that of the older pale and
vceons, Bhinin otund to bmdly

. tly acunnuatu, en; o soinetin

ly cordate 5-nervod and with

[ing—*Materials for a Flora of the Malayan P* la. [No. 4,

their junction with the petioles; length of blade 4 * , breadth 3*5

m

4 in.; petiole 3 to 35 in. slender, swollen and bent at the *huso*.

Tta-

ira-n, xilhiry, sloudor, branched, 3 to 6 in. lei

sessile, 1 in. indiani., authors *it.* *I*

'ores-

stout, t foot or long:

lit much

Uned, clavate, rugos*

■ib-eom-

15 broad; peri

endocarp wo is.

Ma Maingay No. 116, 115 (in part). Perak,

common,

trib. Couliiu-Chiua.

An enormous climber, often with a stem 4 in. in diameter. The leaves and male flowers are excellently figured by M. Pierre, who ever does not appear to have seen the ripe fruit.

, Loureiro.

Glabrous climbing shrubs. *Leaves* ovate to

ol

Flotvers in panicles, *Sepals* 6, with 3 minute

I.

Petals 0. *Male j* ">, lilamouts clav

adnate; c< ig, bursting vertically.

nodes 6. *Ovaries* 3; ovoid, 2-ovtded; stigma sessi

oblong, terete, style-scar Bubternrinal ;

• mvex, vent rally flattened and channelled, hai

-blong, terete, reniform on a transverse section ; album

s,

horn}^; cotyledons foliaceous, longitudinally curved, oblong, very thin ;

radicle short, i i-c.

1. *F. ciiLOi* ,, Miers Contrib. iii, 42. Glabrous,

etriate; bark of the young branches brown, of the

iceous, ovate-oblong, shortly acuminate; the base ro -nerved

(2 of the nevvcs joining the centml one half an i ove the base) ; v<

ion inconspicuous ; length of blade 5 to 9 in., breadth 2 in.; pi

i 4 in., rather slender but swollen and curved towards the U

tiles extra-axillary, or from the stem below ;

• shes horizontal, 3 to 6 in. long. *Male flou*

ly pedicellate ; filaments clavate, fla'

the ripe female inflorescence slender, stouter than

the

about 1 foot long. 1? *wpea* on rather slender terete
are capitate at the apex and *5 in. long, ovoid, smooth, pul
more than 1 in. long, 75 in. in diam., endocarp sm
tacca, Porak; not uncommon, i Thia
appears to me to be a different plant from ., the
type of which is in the 1

7. COSCINIUM, Colobronke.

Climbing shrubs. *Flowers* in dense globose heads. *Sepals* 6, white; bract, orbicular. *Petals* 3, large, spreading, elliptic. *Males* cylindrical, 3 inner connate to the middle; anther lobose; styles six. *Inflorescence* globose.

Leaves elliptic, 3 inner connate to the middle; anther lobose; styles six. *Inflorescence* globose, with a globose intrusion of the carpel; albumen fleshy, ruminant in the ventral furrow; embryo straight, cotyledons orbicular, spreading, thin, sinuate, lacinate, or feebly crenate.—*Distribution*. Species 2; tropical Asia. *Localities*.

1. *C. obovatum*, T. M. Colebrooke in Trans. Linn. Soc. xiii, 65. *Throat* faintly striate, shortly tomentose, often with glands.

Leaves ovate, very slightly peltate; base acute or shortly acuminate. *Flowers* and sometimes sub-sinuate, rising above, yellow to red except the 7 stout glabrous nerves; rachis 5 to 7 in., breadth 1 to 6 in.; pedicel 2 to 3 in., base. *Flowers* small pedunculate beads, in extra-axillary panicles, smaller than the leaves, and, like the

■sistentfc,

■am.; cotyledons sinuate. Miers in Hook. & T. Pl. Ind. 178. *China*.

A tiers in *Taj* tin, Ser. *2, \ *ioerto.*; DC. Prod. i. I >xb. *ms*, Wall. Cat. 4 y:

Pl. *Pereira*

7. Settlements, at low elevations, not so common as the next.

It happens some of the Malayan Islands.

The Malayan specimens have larger leaves and a more condensed inflorescence than the Malayan but the flowers are alike. *Pereira* spooler *O. Maingayi* is founded on Maingay's Malacca specimens (Kew, *Distrib.* 117) but do not see that they differ specifically from his No. 118.

Leaves elliptic, Young shoots sub-striate, glabrous, peltate, oblong, elliptic, rarely

base rounded or truncate, sometimes glabrous beneath, the 7 nerves bold. *Leaves* lower sinuate. *Flowers* are the reticulate length of blade 1 to 7 in.: rachis 1 to 6 in., swollen at base

.> in. 'long, racemose, douthely
ferruginous-
S in. in diam, from
branches horissontal: drupes globular, totuuu-

Hook. fil. & Thoma Fl. Ind. 179 ; Hook. fil. Fl. B. **End.** i. 99:
 FL Ind. Bat. L Pt. 1, **77** : *Cocmdus mus*, Wall. Cat. **5971** partly.
Climbing like the laot on high trees. I have no specimens of
the ripe drupe.

UACIA, Loureiro.

climbing shrubs or small trees: flowers in racemes or panicles.
 ds 9. tomentose, in three aeries; the two outer small the
 r large, rotund, concave, valv 3 or 6, small, (as large
 as
 the outer 3 sepals), obovate, *oh* glabrous, eml the si
 3 or 6, free, sub-equal ; fil iiort, erect, tint
 ■Is; anthers counivcut, cordate, 2-lobed.
 as in male; 'nodes 6, clavate. *Ova* , birsui
 usually 1 by abortion, obovoid or reniform, !
 subbasal; endocarp 3-celled, the 2 lateral cells
 embracing the intruded endocarp; embryo
 linear, plano-convex. Distrib. Tropical Asia.
 1. :IANDBA, Miers Contrib. iii, U
 Jons when young, glabrous when mini;
 icoolate, acuminate e the ro
 of bla 5 in., breadth 1*5 to 2 in., petiole
 supra-axillary, shorter than the lea\
 bracts and and flowers minute. *Stame7is* 3,
 anthers large, the cells di rat. Hook. fil. Fl. *Ik* Iud. i.
 I¹
 Fl. **Ind.** Bat. i. pt. 1, 80. Kurz For. Flop. Bnrm. i,
 Ind. 188. *L. Amh* a and Miers I.e. 11
 , Hoxb. Fl. Ind. iii. 816, *Cocculw i* Colebr
 Trans. Linn. **Soo.** xii. 64 j Wall. Cat. 4UG2, 4959 C. Penang.
 Distrib. Burmah. 2. L. OBLONGA, Miers Contrib. iii.
109, Scandent or branches minutely striate,
 rusty-pnbemloua \v. membmnoas, glabrous, oblong-lane
 mucronate ; the base rounded, 3-nerved w, bold, pu
 like the nerves aud petiole ; length of blade 4 to 7 in., i
 in., petiole '75 to 1^ij in, *Male panicles*
 usually in pairs, much lorjge; the leaves,
 branches
 s 6, lilaments thickened upwards but not _?,
florescence much shorter. *I* tranaverscly reuiform, c<
 glabrous, pulpy, rugose when dry, -75 iu. long, stylar
 projecting horn. Hook. **fil.** & Th. Fl. Ind. 10U j
Miq. Fl. Ind. *liai.* I Pt. i, 80. *Cocculus obi* CinnmoD
 iu all the Sraits Settlements.

Miers remarks Hint V i dose* --pceies aB a bush.
M

[viiustler, who collec? tees in Per scribes one
s

o. 6184) as bushes of 8 to 10 feet: the otL
□.the -male flowers of these

no di te. Tho species is at ouce recognised by the li

3. L. \ VB Contrib, iii. 110. Whole plant, but especial)
the young branch* ous-tti o. s thinly coriac*
ing, of; ibttiBe, ;i<-iite or

linate. ase acute or rounded; when adtdt glabrous and s:
he midrib; beneath olivaceous-ptibesce nerved
tde 3'fi in., breadth I t.,

r tliau the petiole, umbella: liar
>er8 small. Stamens 0, filaments inuc
o, 2-celled. Drupes 1 or 2, transvei

compi sparsely tom> the
Br. Ind. I. 100 ; Fl. Tn.I. Bit. i. Pt.'i, 80 ;
Kurz

iurmah tier
. 4970.
glabrous. JL iiers
Con-

tril 111, t. 10'J.

"fcs Settlements. Distrib. Sumat] L5 to 20 feet long: readily
recognised by the yellowish olivaceous fomentutn, and short cymose
inflorescence.

ci, King, nov. spec. Branches, petiules, and nerves of
ves soffcfy pubescent, heaves sub-coriaceous, glab pale bent
shortly pefciolate, lanceolate, mucronate, the base cuueate, 3-nerved; re-
ti net; length of blade 1'5 to 2'5 in., breadth 5 to 1
in., petiu! pedunculate, axillary, solitary, little loi

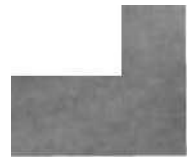
ioles ; C&VBL terminal racemes. M ^ small. &
the filameats short, clavatej anthers largo, cordate, 2-celled,
con-nivent.

North Coast of Singapore near the Sea ; King's Collector, No. 70.
This very distinct species has been, gathered only once. Only the
i], but they aro immistakeably those of a *Liniaeia*. gnished by its shortly
petiolate small leaves, i which (toward tho end of tho
branches)

Parts

Climat
flower
shrubs. Flowers in short axillary
cymes. ;g in number. Sepals in. three rows, the
outer 3 49

HXPSEBPA, iliers.



a.

ly : die inner much larger ; all imbricate, glabrous,
 ■u the inner sepals, oblong, incurved at the apex
 leafy.' , free, in two series; imbricate
 upwards : ; , 2-lobed. I
 or G, oblong, cone
 rarely 3. Style very short. I),
 ' fleshy ; end bony, sub
 grooves, and with a single locular cell: embryo
 is long as the cotyledons.

I. \, Miers Co; iii, 10S Branches
 si

leaves small, herbaceous, shining, glabrous, ob-
 long, tapering gradually to the rather blunt
 tip; the base very 3-nerved ; reticulate
 the nerves ; length of blade 1*5
 to 3 in. Vines about 3-flowers long*
 petioles, usually solitary, axillary and supra-axillary
 Malacca ; Griffith, Maui (Kew Distrib., 123) : Per-
 King's Collector. Distrib. Sumatra.

J The first with the types of Hillebrand
 in the Indian Z. They do not agree
 with the Indian Z. *lata*. King
 Bowden's flowers so different from those of
 ought not to be included in that genus, and

I •
 that Miers' genus *Hypserpa* has a sufficiently sure basis on the struc-
 ture of the flowers alone.

10. Coccoloba, DC.

Climbing or sarmentoso shrubs, rarely
 at the base. in panicles. Sepals
 6
 • 5, smaller, usually 5-lobed. Male flower: si-
 milarly transversely. the
 or 0. Ovaries 3 to 6: styles usually cylindrical.
 laterally compressed; endocarp horse-shoe-shaped, dorsally
 tubercled, sides excavate. curved, uncommon fleshy;
 e
 annular ; cotyledons linear, flat, appressed.—Distrib. All warm
 1. 0. KONSTL) in, n. 8p. Glabrous:
 Leaves membranous, with long petiole*,
 raised from the petiolar insertion, thin, beneath
 under surface ; length of blade 3*25 to 4 in. 1st
 petiole slender, terete, about 3 in. long. Panicle from flat

h embracing a-stamen. *Filauiefaf* free, clavate; anthara *h*
d. ir 1 to 1'25 in. lonp["> ail(' ^bont 6 in. broad, narrowly
sub-obovoid, compressed ; pericarp of a^"*31 P^lp; endocarp horny, nar-
■'y liarse-shoc- .1, tho edge bob^{1'} '4*^ the sides with ■ !
1 the centra?-- l^{art} with a d&* ical hollo v
bryo sa i, bop^{to} along tho cir the
■p.

■ 1 lector, Nos. 4117 and 1
the fl w, but tho fruit of S/>
U has a .similar though
lecies, would belong to Miers* genus *J)lj*
ear *D. pict* athor.

11. PERICAMPYLCS, Miers. A cLimbiag shrub.

Leaves subpeltate; petioles slender, artcula
y cymes. *Is* 6, with 3 bracts, outer smaller, inner
} cum •. ■ *flower: stamens* 6, tilamt- lin-
:ie, segments sobulate. o-s
hue-shaped, dorsally crested and L I; cotyledons
elongate, flat, scarcely broader than

1. Triers Contrib. iii. 118, t. 3. Toang-
branchog
mi nut- membranous, orbicular >m,
>metime htly rei uicrouulate, tho base trua-
; ttpor surface pubescent or glabrescenfc, lower to-
. longt.li of blade - to 4 in., breadth about *5 in.
L to 2 in, *Cym* v, axillary,ia fascicles of about
4, 2- ius. *I* minute, crowded. *I* ite, larger
sepals. *I* >vpA the sixt; of a pea. Hook. 61. Fl. Br. Iud. i.
Ch. Fl. Indu !; Mi<|. Fl. i b. i. Pt. 1, 83.
P.

us, and *Hvnnhranaceus*, Miers *I. o.* 119-122. *Oocoidas*
. in Trans. Liuu. Soe. xiii. 57.
Wall. I I (not oiDC.). *Men llomm, Roxh.* Fl. lad. iii, 8

i. British India, Java, Sumatra, [*in* Archipelago.

12. iro.
Fl" n
axillary,
cymose umbels 6 to 10, free, ovate or obuvate. G, connate,
3 to 5, obovate, fleshy. encircling the top of the

an, burst ing transit¹
 f the male. *Star,* *s Oi* *Ovary* 1; style 3
 jlabrous; endocarp *co,* ^{e**>} hi loe-shn
 sides hollowed and [almost annular; c<
 slet he Old
 1. ■i.9*>." mug 1
 ily ovate-rotiin., 1 acute or a.
 obtuse, pi the 1 ■ ^ or sub-cordat
 rous or sparsely pubesci about 10 radi a ti.".;■><;■ from
 tl
 biolar v Lred on the pale or gin le]
 open; b. of blade 2*5 to 5 in., b to
 Lolo 1*75 to 2 in, I long slender pedm
 III.
 103; Hf. & T. FL Ind. 1 Fl, Tnd.
 222. #. *intertextv* . and *h*
 . Willd. ;
 Fl. Ind. i -7 D, !
 DC, *Lc. i.* *I Bijdr.* 2 ', liob. /f. iii.
 'ioda-. i. 14 ; Wight Ic. t. J.
 *

LOH m shady places. T>:
 British India, Australia, Africa.

13. CISSAMPELOS, Linn.

tSubcrect or climbing shT-ubs. *Leaves* often peltate, ose. *Sepals* 4,
 5 or (j, erose. *Petals* 4, connate, forming a cup. *Anthers* 4,
 connate, encircling the top of the stamina! column,

ra«cemed, crowded in
 (or sep: petal I each;. j
 nate t<
 bracts. 0. *Ovary* I j style short,
 c sub-basal;" endocarp hi
 'y tubovcled, sides excavated. >d
 curved ■.
 Ledona v, |-terete, appressed.—Dietrib. All hot ci"
 1. C- PABBIRA, liinn. Toung branches pubescent. *Lead*
 ate, mombraneous, orbicular-reniform or cord- ero.
 nate, site to cordai

r pubescent to torn* ; length 1*8 to 3 in., breadth i
 tirole 1 to 3 in. 2 or 3, axi]
 with large reniform or lar bra
 2 in. in . t. fil. Fl. Br. Ind. i. 1
 t. i. Pt. 1. 85 ;
 D
 Conirib. iii.]. ■a-jjebu, Linn. Raxb. Fl. Iud. iii

. 41)79; W. & A. Prod. i. 14; Boxb. Z. c.
rsuta, Ham. DC. /. cv. 101. r rsa, grw
a and delicatida, Miers I. c. 187-189. O. a;
Thw. Kunm. 13 <fc 399; Miers I. c. 195. Menispen

A common climber in all parts of the Settlements. Diatrib. J
where in the Tropics.

14. CTOXBA, Arnott.

r shrn&s. Leaves usually peltate. T in axillary pani-
cs 4-8, connate into an inflated 4-5-lo [yi
connate into a 4 or 8-lobed coroll:
connate, crowning tiie stamina! column, h
I 1, oblong. Petal 1, ofammlar
lobed, lobes radiating. Drupe ovoid, style-scar aubbasal
liorse-shoe-ahapod, dorsally tubercled, sicle.T convex, &-locel!at
curved; cotyledons slender, f-terete, appress* oal

Asi

TA, IT 1\ & Th. Fl. Indica, 201. Branchlets v
tit OL- glal Leaves coriaceous, peltate, deltoid or
acute or acuminate, of tun macro se tranc
to i :)O70 glabrous or sgent, beneath pubr to fcomen-
ther proiniiL-Fit, length of blade 4 5
in,,

breadth 35 to 4 5 in.; petiole *2 to 2*5 in., reflesed, pubescent or torn
tose, strisito. JPa usually longer than the leaves, I

mn ached and Spreading and a foot long¹, t1'o

Gabjx 4-lobed, glabrous or piteS i-nally.

Corolla

nine tiler, inn, pikse^j endocaTp umc:h tubercuh
•k. Kl. Kl. Br. [ml i !■ ■ ,. Fl. Ind. Bftt. i. Pt. 1, -
, versicolor. and jj
, Lamk. Cocculug pel ta ties, DC.

\V. & A., in pai't. Cyciea Bw Vrnnot
ia

ill' HI. is Burmanni, Miers in Tayl. Ann, Sur. 2,
(rl.

Not cpjiimon in the Straits Settlements. Distrib. Java, Bril
Indi !on.

•■■■. nov. spec. Touag branches spirally striate,
otherwise glabrous. Leaves
-ill Bur >ns
o ovate-obloi . tcuminate, th(
I of tlit; nerves minute) ; Le £ blade

0 2 in., j about i in, *Male* and /

Or. King—*Materials for a I*

panicles sub-equal, slender, solitary, axillary, show¹
crowded, minute. Siliques about 4, broad,
slightly compressed. Pulp thin, endosperm boldly tuberculate.
Pericarp; at elevations of front 150 to 1000 ft
Scortechini. A slender creeper 1 to 25 feet long: not climbing.

A vs.

Climbers or shrubs with pinnate leaves, inflorescence 1-flowered,
numerous, in axillary fascicles, flowers dioecious.

Leaves in decussate pairs, the two on
inner side concave, glabrous, imbricate, 11 in-
wards, *l* 2, smaller than fourth row *qi* 11
filaments clavate, anthers sub-globose,
known. *Dr* 1-3 (usually 1) sub-globose,
thin, sub-reniform, 1-celled. *Seed* sub-globose,
albumen none; cotyledons oblong, semi-terete, thick, woody,
inert.—Distrib. Eastern Archipelago.

1. A. LUCURIA *lucurii* (L.) Merr. *Contrib* iii. 357. *Flora* of
of that of old

the
pe[^] (male unknown
(usually solitary) pyriform, glabrous, shining, abscis-
sion endocarp thin, brittle.

L Ulu Bubongin Perak, King's collector. *ib.* Jai
A slender creeper from 40 to 100 feet long. *this*
nkuowii, and I put it into this genus on account of the structure
its general resemblance to *A. fasciculata*
in being non-scandent and in
resembling *A. fasciculata* (alfochoi
4), which is also a climbing
'tided *Millettia* of the genus as to the fruit
and other particulars.

ORDER VI. NYMPHACEAE

Aquatic perennial herbs. *Leaves* usually floating
as involute in vernation,
all free, hypogynous or the
carpel

receptacle the-
disk; **stigmas** as many as carpels, peltate or disk

or many and scattered *over* the walls i cells, anatropous or orthotro-
| is. *Fruit* formed of the connate carpels, or of ?•• ideli is.

■ of the enlarged turbinate flat-topped disk with the nut-Iiko
sunk in its crown, naked or ari] tbutnen floury or 0 ;
■ *ryo e*; i the enlarged atnnotio sac.—Distrib.

Temperate
and tropical; genera 8, Bpeoiea 30-40.

Suborder I, *Scp* ami *stav.* de-
fiur ii one another or -with the disk into ono
TJ. 0 iauy. aminoua.

orted on the
disk wh ich i t wi ft tlle carpels ... 1. J^T# *mplima.*
Lor j carpels sank in the
... 2.

fe-5. *P bah* and si ie-
,i-ly scattered, sunk in pits of the tm isk.
Ibuminovi ... 3. *NeUm*

1. NYMPHEA, L.

Lafgo herbs ; rootstoc! *wen* expandnrl, large, fl
on long rad nate to i]i. of the
ssively transformed into stamens, all
anthers small, linear, introrse. *Ov*
tny iy disk and forming with it a manj
. radiating, stigmas: ovules many, igy berry
ripening under water* *Seeds* email, ib.
Species 20, most temperate and tropical

i A.TA, Willd. *Leaves* elliptic, deeply cordate, entire or
chod with purple below, 6 to 8
i 9 in. in diam., blue (white, or pink in varieties),
10 to 30, ! anceolate. *Stan* ■ > to 50, anthers Twith a]
ippendages. *fs* 10 to 25. 1*5 to 2 in. in diam.
-. Hook. fil. Fl. B. **Ind.** i. 114: Hookfil. & Th. M. Ind. L 2
Lit Ic. Miq. PI. **Ind. Bat.** i. Pt. ii. 90.
i throughout *thu* warmer parts of the Indo-Malayan region.

I:• and *leaves* ini
the next: white, rose or blue.
N,

L 577; Bot. Mag. t. 11 in Trans,
Linn. Soc. >: ihm. der Gatt. i^ymph. 7 and 21.
Hf, & Th. I. c. *Leaves* and *flowers*
mnc

fian in the last, the I usually blue and sometimes
 than 1 to 2 in. in diam. JV. *etdlata*, Willd. W. A cod. i. 17.

2, BARCLATA, Wallieh.

Aquatic herbs v horfc rillous rooi .s and floating leaves,
 te, sometimes extra-axillary. •» pmk or claret-
 nn merous,

inited below into a I hich is conftue; ; the ■

my series inserted v Jlatube, i

slim id; the rs pendulous, the out
 iut 6 to aflaent, the apex conical j styles tri-an
 cone, Btigmatiferona within : ovnl

.rit'i- 1. *E* lobose, pnlpy, c
 and lar torus. elliptic, albumen fl

1. B. ICOTTLETI, Hook. fil. in Trans. Linn . xxiii.

and, the up ex sometimes bluntly i
 , glabrous on the upper sur
 ; length 3 in., breadth 35 in., 7 in
 tally with long glabrous sub-aj>ical tail ir, pink

or r

In j iw elevations in the Forest. Mai:
ik, Soorteeliini, Wray, King's collector. Distrib
 Lobb.

Yar. KuNSTLEiti. *K* Leaves ovate-rotur
 surfaces and petioles pubescent or glabrous,
 'claret-coloured ; seeds rugose, occasionally echin;

In similar situations with the last. Perak; King's collector,
 :ini, Wray. The loaves of this are thinner in texture than the
 typiuul form.

Wall, in Tx-ans. I

oblong, obtuse, the base cordate, glabrous *io*
 in., breadth 1 to 1"5 in., pe b to 8 in. jlabresi
 with short apical tails. blong, i ithin, \ ,/y.

Seeds echinaUs Hook. fil. PI. B. Ind. i. 115; Hook. Ic. PI. t.
 Griff. NotuL 218, t. 57; IX. f. & T. Fl. Ind. 24(3. Andamans.
 Distrib. Buruiah.

3. NBHTMEI

An Uirge water herb with mill,
 I high above the
 white or yellow.
 and stamens many, hypogynous,

h a clubbed appendage. *Ovaries* many, 1-celled, sunk in the of an obconic fleshy torus, attachment lateral; style very short, oxserfced, stigma terminal, dilated; ovules 1-2, pendulous. *Oar* void, loose in the cavities of the enlarged spongy torus; pericarp bony, smooth. *d* filling the carpel, testa spongy, albumom 0; cotyledons fleshy, thick, enclosing the large folded plumule.—Diatrib. Specie one Asiatic and Australian; the other "W. Indian.

1. N. SPECIOSUM. Willd, *Leaves* 2 to 3 feet in dJ ions.
Peduncles and petioles 3 to 6 feet long, smooth, or with small seatterec
- 5. *Flo* to 10 in. die letals elliptic, rose, rarely white.
pped 2 to 4 in. diam. *Rl*
gut & Arn. Prodr. i. 10; **Roxb.** Fl. Ind. Tl
BT.'E & T. Fl. Ind. 2-17; **Miq**, Fl. Ind. Bat
Rieh. in Aim. MB 1*9, t.
ot. Bot. i. 59, t. 31, 3
Stilish. Ann. Bot. ii. 75. *ho*, Linn.

In ghout the Indo-Malayan region. Dist
tan and tropical Australia.

ORDEB VII. CAPPARIDE^E.

bs, shrubs or trees, erect or climbing. *Leaves* aim
ipules 2 or 0, sometimes spinescont.

- 1, corymbose or nmbelled, i
ilar, usually *ds* 4, free or connate, valvate
1 (rarely 2 or 0), hypogynous
Dud. *8ta* !■ or m
the base of or on a long or short gynoi
; r. ■ ■
short or ■ -sed or capitate; ovules indefiuifce, ou 2
i phi- or campj 1 o-1 rop o us. *Fru it* caps ula
form, exalbuminous; embryo incurved.—1>
em i 300, chiefly tropical.

I. CLEO , Lttnn.

triple or rfigitately 3 to 9-foliolate. ./
irple, spreading. *Pet*
• i ou the disk. *Ouar*
ales many, r m - | 2, separating from I
reniform. Distrib. Species about 80,
chit

G. Kiang—*Material for a Flora of the Malayan Peninsula.* [No.

I. C. HUUEITH, King, n. sp. A much-branched decumbent
shrub; the stem striate, pubescent, and with a few short;
distant pairs. I. dimorphous; those of the lower part of
2m petioles, trifoliolate, those of the upper part
; all pubescent and from 5 to 75 in. long.
solitary, axillary, about 5 in. in diam. Stamens, slender,
longer in leaves, Capsules terete, striate, glabrous,
about
II. Ion; *lurica*¹
Singapore, in dry places

This is allied to the *P* *lar* *Indi* and
JBUI *vi* W. & A., but differs from both in its dimorphous leaves.
SA, Linn. An erect glandular-pubescent
lower with long petioles, 3 to 5-foliolate; leaflets obovate or ovate,
narrow, anthers pedicels. *J?* *etal* yellow, hexagonal, striate,
12 in. long, glandular-pubescent, striate,
narrow.
5 in. long, all reniform, took.
Fl. *Bi* Ind. i. 170 *J* *Miq.* Fl. Ind. Bat. i. Ft.
Vail. C '68. / *Wigh*; A
common weed at low elevations in the tropics.

sis, DC. An annual,
glandular-pubescent or glabrate herb. Z
effloresced. *Flowers* racemose. *"S"* *I'd* *ale*

opening, long-clawed, open in bud. S
to the slender gynophore, spreading above
ma? *ipsule* elongate, stalked: valves 2,
acentas. *Se* m, blao
1. G, PEKTAPHILLA, DO. I L 238. Alt
, spreading herb. *Leaves* <,
obovate or cuneate, acute or obtuse

3-foliolate. *Capsules* cylindrical
Un. long. Hoot. fil. Fl. Br. Ind. i.
. 1, 96. W. & A. Pro., 21: *Q. a*
*pen*¹ *'in-* Roxb. I. ii. 12
Abundant in waste ground all over the tropic

CAPrAttLS, L!

brubs, erect., dee us.

*Leave** aimj

■ ing—"oiaieri

showy. . I'Yc'e, imbricate in 2 series, or 2 outer subvi
 sessile, imbricate. 'Sla> insertt
 the of the long gynopl: ury stalked, 1 to 4-ecl
 sessile; ovules many, on 2 to U parietal placentas. Fruit
 ^fcng by y, imbeddi :-ulp, testa crustocous
 oriaceous ; cotyledons convolute.—Distri" of
 all **arni climates, < ST. America.

Lobose or sub-globo-

ii\y, axillary

1. *O. harutem ria.*

„ abollate ...

cchinii.

„ racemose

supra-axillary, iii rows of 2

or 3.

... 4. *O. micro**

Le to <t in. long

... 5. *O. j*

in. long . icuinber-shapcd. Fruit

4 i ■

7. .

„ 3 in. long. ...

ig, n. sp. Scatdent, the you t witli minute,
 rusty, snb-deci<luous, •iumeu.tum. short,
 hooked. Leaves glabrous, obtuse or retusej
 the midrib pron

;fch 1 to 1*25 in., brei in.,

solitary, glabrou a half

iu. in (Ham., white to pink.

r rotund, con<

it i-. lophore slender, nearly 2 in. lo
 k.

Daroot, os. King's Collector, No. 5103,

ir, 30 to 40 feet long. The petals change Ripu

fruit is unknowu. This must bo near *O. eryi*

\, Linn. A scrambling shrub. Branches divarir

short recurved thorns, sub-st riate, the youm

nous, shortly potiolate, ovate to ohlong, i

zea 4 o lowers, *35 to *5 in. in diam., in

•Issk'ii "-in long; bads globose,

j^ow . Ooary O '25 to *5 in.

i. Dr. i. 177: M!|..

PI,

Fl. TIH. i

Dulz.

.ojjilj. Flor

rra.

In hot. >1>y places at low elevations, but not common in the Strait
 Distrib. India, Ceylon, Philippines, Timor, Austral'
 ii, Bang, n. sp. Scandent; y ' 3, and the
 essence at ft] es densely and minutely inous-tomentose j
 rith 1 or 2 striae, glabrescent; thorns t ■, in j:-
 imu the petioles, hooked. *Leaves* coriaceous,
 broadly
 ainate, much narrowed at the base, smooth and shining
 ove and the i; under surface fen ts-iomento
 ig glabrescent, the midrib and 6 pairs of nerves
 minent; length 5 to 8 in., breadth 2 to 3 in.,] in.
 1., on short lateral, leally, bracts a us,
 J mid,
 externally. *Pet* infc,_broi
 more
 oi.; the gyuu Iy wrinkl
 . in dia
 In Perak. King's Collector No. 8083.
 The fruit of tS been only once collected. The &
 .•et lou closely rcsembl
 but the I- pie but pi nerved.
 DO. Prod. i. 217. Shrubby
 Bran;
 the leu. iolt'R, divergent, poliished, noi
 "oas, shining-, minutely reticulate, broadly \.
 io, miK ; the base narrowed or roui midrib stont,
 -; length 3 to 4 in., breadth 1 in.
 .edicels, 2 or 3 in a line, supra-axillary. n diam.
 ; the former puberalous, the la
 shorter than the nynopho?
 1. Br. Ind. i. 179 : HicL. Fl. Ind. Ba
 Bio? *ispicua* and *O. J ina*,
 -ted at low elevations thronrrlxoul
 Di«tiib. Burmah. Sir Joseph Hooke: (which I have
 not seen) as 2 to 3 in. in di. C. FUBiiaOEA, DC. Prod. i.
 246 ; var. P<
 Bhrub 15 feet long, i'rom the
 c^sed, striate, glabrous; thorns in pi
 nons, elliptic-oblong, shortly acuminate, the
 glabrous on both surfaces, nerve* IQ pairs) and
 jminent; length 5 to 7 in., breadth 2 to 2'5 in.;

channelled. J7< in. in diara. on long slender pedicels, 2 or
 a line, supra-axillary, oblong, concave, the two inner recurve
 the two outer pubescent externally. long¹, t] or united at the base by a gland so as to form a short spui
nens numerous. *Gynojphore* about 1 in. long, pubescent as is
 t

Perak. Qcortechini.
 only once, and without fruifc. Tn Seortechini'a
 5eld nt that I lie petals are pubescent a ouni
 5m; ,-land, and have a purple blotch.
 A ^ing but non-scandent shrub, almost unarmed, the thorns
 til. This variety d from the type as described by
 by Decaisne from Tinio LT. Ann. du "Museuin, ii,
 ing the-venation of i\ more straight and erect
 lienvisc

XA, Wall. Hook. fil. FL Br. Ind. I, 179. So
 e spines sii; bt, in pairs, very short, wit
 kisli rather blunt tips. *Leaves* coriaceous, sh
 oadly lanceolate to elliptic, shortly ncurminaf
 ie under snrfaco pale (yi on dv\
 midrib au< >i nerves very bold; reticulations minute, disi
 the upper em h 6 to 7*5 in., breadth. 2'25 to 3 in., petiole
 undi -jk. fil.) solitary or in pair.-, sup
 tan in. -■ lanceolate, at

G. King— *Mai&riahfor a Flora of the Malayan Peninsula.* 395
 stout stalk of which 1'5 in. is jiedicel and the
 i*o in. . cylin' ■ to the apes-, 4 to 3 in
 7 in,
 s. in diam., yellowish-red, gla-brous. s
 ovoid

Singapore, Wallich : Ulu Bubong in Perak.
 Sir Joseph II yjio describes this s in the Flora of Bri
 Singapore speci i which are accoi I ,
 bi
 in donbi ^iother this is erect or scandent. K
 ;ns show it to be a creeper 20 to 'JO
 to be a common plant.

ware

King, n. *y. *Sc&ndcnt;* brancn/efa
 rlabrous; finefy

irns stipuhxr, in]>airs, I I, very
glabrous, sldning, more
rfcly acuminatf, tho
i 8 or 9 pairs anastomosing in
•cb.es, tin. y nerves bold as is tKe tmtlrib.

the reticulations distinct; length "yo to 7*5 in., breadth 1*75 to 2*2
ole under P5 in , "-s unknown. Fruit cylindrio, tap
the apex shortly beaked; w] loured,
3 iu. lung, and 1' i diam.; gynophore nearly in.,
slender. smooth, -A in. long.

tor, !N"os. 100 unu J w i

A eet long 5 allied
curious cucumber-like fruit, but with d Floi
have*; u colh-
8. TU sp. Scandent, llio "branches glab-
rest- itipular,ii] dly "1 in long.
ilafce or ob? ite, ac: .both &■
- '■ 7paii Lb-horizontal curving nerves pro

titary, it 2 iu.
long, stout; |
Bubu, iu Perak, at a 00 feet, KIBR

A creeper, 40 to 60 feet long. Only fruiting specimens have
been collected.

4. ROYDSU, Roxb.

!*ge unarmed woody climbers, bri;
t yellow aedor pnnicli
atle imbricate. I\ se of the short
cylintlrrie gynopho i the prolongation of
the p]

bigmas small, ml; ovules m
with a woody 3-val
ledons -teagtitndinally fol
tin ig the smaller.— 1 ~^^

1. B. \^otul. iv. 578 ; Ie.

A it, slirui S feet high,<
in md toincutose sepul wes membrai
liptio, or sub-rotund, with an abrupt sh
s shining, li il> bold; primary i
a the tinder surface, as are the
ilations; length 3*5 to 4 in., breadth 1*5 to
•5 litlj thickened in the upper \m\L J
racemes ; leafless panicle
!y pedicellai ha. in diam.
oblong, snb-acutc, densely tomentoso on both

1889.]

20 : filamenfcg equal, not compressed: anthers innate.

G. King-

a *Flora of the Malayan V,*

Pistil as ionff a3

aophore shorter than the glabrous, 2-oelled, ov

3, globular, minute.

Fruit unknown.

Kookfil. *fl* U_r

Perak.

Kin_vL

lector, No. 1611.

Distrib. _

King, n. sp.

Scanclent, glabrous except I

pubescent iuff

pa_i8i

Leaves membran<

[ip.

iruptly

narrowed 'to the

i shining; the lower pal

midrib and 6 pairs

of

inent: length of bl i.,

thickened in the upper half and

or axillary panicles or raa

,te

ds 6, sligi

W r - o U

.,ate, minntcly tomentose c

; Jong as the si s, the gytioph

puberuloua.

glabrous. S

Jong as tho

stigmas 3, sessile, ovate, small.

yellow, 1-5 in, long and 1 in. in diam.; endocarp icortechini,

Kind's Collector, Nos. 8464 and -4225 : in

bo 1*200 feet.

, the collector describes this 'a

as

t long"; in that on N't

vs, ■

■^h." *TPr.* chini's specimens have no notes.

led twigs, I believe this is

a

ad the. last belong to the section

;vn undivided st which

B. I. L 409), I'-vposea the sectional name of

bat

doubt as to whether it should not be

3 group belongs also the Philippine

ch. An nndesciibed B] from Bnrtnali

in

,lls into

5. ORATSV A, Linn.

vge, yellow or pnrplish, poly-
tow with the convex lobed disk.

a in bnd

nate

to

of

I-celled; stigii

Lie,

Ip.—Di

10. A small glabrous tree with pale smooth b
nearly so, sub-coriaceous, obliquely elongate ncoola*
one narrower than the ou' her bluntly acui
narrowed; upper surface shining, lower pule dull wii
ner 5 in., I in. to 2'25.
hermaphi' ;!>ose racf 2 to 3 in. i
Petals obovate, obtuse, UDL [S^vx th:lu

small, la] obtuse. I ovoid, glabn
gynophore as long as the filamentB ; stigma si

parietal, mnlt dovulate. !lore
void, smooth, purple ' with -ore
. in diam. *Heeds* embedded in pulp., compi oid-
reniform), smooth on les, shortly tuberculate along the ed .rly

Maingay (No. 1

King', ctor, M

A species distinguished by its sessile leaflets
tn] jed seeds, Kurz's figure of the is baft'
sedly work- h imperfect material ii ibiug I

BCt: i

Suppl ;ug£from the i
probably refer to. this plant; m which case the
would stand.

2. C. HyasopniLA, Knrz J. A. S.

B.

Jonrn. Boi It fcab. 148, figs.

G, 7

ifch pale striat. lark; the yo.

Le iembrano's, ^
nate at both base and apex, the lower s* tt; net
S sub-horizontal; length 3 to 4*5 in., b.
-, solitary or in

2 or 3, c

t with a blunt beak when ripo, brownish, sp aud
1*5 in. or more in diam.; the carpophore and 2 in,
long, dark-coloi pnlp., *5 in. in diarn., compresses over
tho greater part of the surface.

Trang: King's Collector Burm;

Kurz founded this species on 8]

frn ich aro now in the Cal u, Tl

maus (in mature fruit) agree wi Kuiv

. For it was made from a young

■1 its full size, nor it oics are as yet
unknown ; but the ripe I unoi

Malayan

those of Km'., but are more bn

i tho G
No, 813)

o C. . described as ha
s t u in,—a c 11 aracte r, so
.ibly a but, in
sappea r i ■ han anj *

or shrubs.

r sevralai
persistent,
as, equal

hud. o* iilaments

free or connate, tiieir cells often with a\
I, produced beyond* the cells. Ovary sesailo, I-celled
-igma caj truncate or cupular, entire or lobedj
ovules
3 parietnl placentas, anal a 3-valved capsule.
il, album* iraight, eofeyledona flat.—Distrl
fcives of tomp. and >n&
. Corolla irregubir; lower petal dissimilar.

L V

2. Alsod*

1. VK.i.A, Linn.

Herbs, ty shrubby below. Flowers, on 1-, rarely
2-flowered

orphic, si' rgepetalled which ripen few soeds,
tiled or apetalons and very prolific. produced at
or spreading; lower largest, spurred or sac
■s connate, connectives of two lower often sj
ate or truncate, tip straight or obi .ma
if. C" 3-valved. Seeds ovoid or j
ns.

LH i. Wall. ii. 449 (not of Cat.),
ibrous, stolons or steins usually
ovate-i -i obtuso or aoutu, crenate-
pules t(acute ; capsoies

glabrous pubescent. Stigma very oblique
 or
 quite lateral, often narrow and perforated. Hook. fil. Fl. Br Ind. i. 1
 Miq. Fl ii. 113; Royle 111. 74, t. 18, f. I; \ Prodr.
 *Y, [: escens, Thwaites Enum. 20. F. j
 Inrl, Bat. i. pt. ii. i
 HI Ulu Batan* , L. AY or. Di^■
 ranges of India, and of the Malayan Islands.

2. AXSODEIA, Thouars.

Tre< safe (]
 scicled, cymoso or
 in with
 , insert- do or upon an ai
 i>ranoi!
 ■limes with s
 style si miles
sul ived, few seed< oua in fchi
 Distri ioe aboi pical American.

L. *JPro\$tkesia*, Bl. (Anthers with a subulate
 e from the apex of each cell, and a broad (usually cl [ago
 from the cotil1■

1. A". WALLICHUWA, fil. and Tb. Fl. Br. Ind. T? 1
 glabrous shrub. *Leaves* membranous, oblong-lanceolate to ellip; irtly
 acuminate, entire or Blightly serrulate, the
 roves curves 10 to 15 pairs, arching, proni
 length of blade 9 to 12 in., breac i , peti
 lowish when dry especially on the under sur!
 late, 5 in. long I tea shorter than the
 petioles.

s linear bract ■■ te. I
 : sepals acut ■jri
 petals, I l>lon^ attach!
Anthers o small apical process on v
 and a *lnrge orbiculi in bran
 the dorsum. *Pistil** rudimeni
 spreading, ovate-acute^ short
 ase, their apices recurved. *Fil*
 male, the anthers without \
 style cylindrii bglobuht, obtusely •
 long, u into 3 blunt valvi moth
 Penar llich. P< lu.
 The flowers in this 6] pparei

J89.] King—*Mateia* & /o?

more frequently dicecioua than monoecious.

Ii

stamens occur the ovary is either absent or rudiineni

with a well developed ovary the stamens, although in must cases

iy formed, contain no pollen. Thest

rences in the loaves, those of the male

planl

ig oblong-lanceolate, narrowed to the base and perrolai

with ft- elliptic leaves with rounded or *slig*

narrowed bases. Spi •-a of the former, police ted in l ere

issued by WaUich as No. i bis Catalogue under the uaiue *Pea la-*

while .ons of the female were issued e. 7501

nn-nan tJie uote.s by E. Drown). These *notes*

are

ws: on 2s

L, " V *hihi ; arb*

- *fie*

glaherrvth ulis am

llich was wrong in referring this plant to the genus

f Lonreiro, fur that author describes no appi to its si

Ifc belo ly to the genus *Frostlicsia* of Blume (Iiijd.

A. KUN^ a. sp. shrub or small i

iimoa

tiiuate or cai ttelj

y serrulate, very much Lo thu

I; lower dull, rough from tbr

■i prouintiit a sec titling- in

id sabi : the reticulii oinute &n(

petiole in

axill

clea or hnrt r; i 8, br.

Inui the leaf-ctiol' tmbrica

"Tlervod, the ■ . *Petals*

■at reflexi -le, rigid. 'tis with short flat tila-

apex of a lobe of the deeply 5-lobed disc.

■ut pc " Hi) broad, adressed to the ovarj with 2 linear

[orsally-ati membranous

ig into a cone round th : part of

d-conie; the sty! L, cylindrio".

.-, snu 5 in. long, dehiscing in I

-hini

-Tfip

ina, to which it is closely allied
i

is caps

Is. u

more acuminate ro

.

(

■

h

v

u

l

v

ini, King's

i

o

n

s

.

T

h

i

s

s

p

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c

i

e

s

i

s

m

o

r

e

o

f

t

)

i. 188. A small tree, glabrous
anoub, m

acntc or sub-acuminate, S6rrnlat<
■o mine n t below as a

wase roi ; main dervi
us verse secon da

■le'l-Vi pules lam
on pedaiiclej 'm. ?r 8
-iibiic: t,und₃ or broadly

ivate, obtuse, vilhms in 4|f middle externally.

cxteri

line along the midrib internally.

th short, thiuk,

densely

imentose filaments ins< i a thick, sub-
teutive ton behind. Air
and 1

-globula

illous-tomontose. (
trith a white spoj

>void, sparseiy strigose, the valves ac
irun..

Malacca, Griffith.

4>. A. Q. sp.

shortly pul ■ or ; bosc. I thin w]

oboi c, shortly a -her abnrptly acui

Iobc ise narrowed, rather tmequ&l-sided, both surfaces

bae glabrfi'

the midrib and 6 to 8 pairs of pubescent arching ner\

cnlations wide; length 5 to 7 in., to 3 i

bescnt, 5 iu. long; stipules sul Q1

ixi; ^sod, sessile, shorti a the

U 5, unequal, the 0 - rather smn 1 lor thai
-obtuse, pubescent v- 5, obovate^{lj}¹⁵
- ciliolato wi: -\pressed hairs ou I
5, glabrous, the filaments very short,
Inthers broadly cordate or 8ub-teni subulaj
he cells a:

■-.lice blunt:

id,

canncle.

Perak at low .

AB1U-U! it tret

fewor-

^>. A

lieellate.

to or lan> pex al.

jntire or obscurely serrulate, gra<3 : rowed

rves 7 to 9 pa

8 in., breadth 1'5 to 2 in., petiole '25 in. ; stipules ovate, only ■] in.
es axillary, and on the older branches from the axils of
fallen 1 rous, rather denso wl.

d open, I 75 to 1*5 in: long, bracteoles J hVels as I
longor than the flowers. *Sejxils* ovate. it or glabrous.

tr blnir . longer ri

g-the n external); oae, thefil

long as the rather deep disc. *Anthers* broadly oVafce, the base
cordate,

suH- cm, the cells each with an apical point and with a broad
o acute dor adage wid<

style oylii the-stigma cup-s

ely angled, L

i. long; the *vn.*\vGHunequal, obtuse, com: I, sub-T

le, minutely mottled at the apox, the base with a papilli

ilied caruncle.

ai low elevations, Scoi /i, Wray, King's Collec;

A tree from 2u to 30 feet in height; readily distinguished by
its

on, larativcly long, racomes. . This closely resembles

Blum

mica.

p. A BUI ons shrub, the brai
mberulous bark, rare Hare.

^ljortly peti' ly aou

i to the base, leng rarely 6 to

Ith 1 to 2 in., petiole *1 to 3 in. ; stipules linear, only 1
in.

, crowded, axillary or extra, axillary, '25
in.

pnbis lanceolate, t<>mentose

i liickened and tomentose along

inside of a- disc which i

a te,

ndago as broad as itself, and a terminal apical procc
i cell. 0 rnsely is the base •

pitate. ' minutely fulvous-velvety

labrou.s when old, ov ith obtuse angles, 'l'2o
in,

■75 in. iam.; the vah^es blunt, navi^ow. JS'-

wn, UK ib-apical papillate pitted caruncul

echini, Wray, King's Collect!

i. [n reaped of leaves very like

t, but siitalKj-. —The very bl — mes, more hairy flow—
wever, from thai species.

A glabrous .shrub or small tree, the

parseljt .ous, elliptic-^

rues oblaneola^e, acumioe

rowed at the b

188
to

at

serrulate, pale when dry; nerves 8 to 10 pairs, slightly prominent bet
ngtli 4 to 6 in., breadth 1.5 to 2.5 in., petiole 2 to 4 in. j BJ
ius, pale, ovate-aci: ■uberalous, *25 in. long.

Macemes

terminal, 4 to 6 in. r numerous 2 to 5 flowered cymules ; bra
broadly ovate, scarious, concave, si ^epals ovate, cili'

oblong, obtuse, the apex undulate, crose or

from the edge of a deep fleshy disc;

anth or s ovate, with a broadly ovate appen< i the I the

back curving over the apex, the cells divergent at the-
subulate terminal npon age.

sessile, :

with a few white adpressed hairs

: ■rtmcate, enp-shaped, id, bluntly i

ilaio, '75 in, long; valves blunt: seeds globose v
lulum, pale, smooth.

'Peruk, at low elevations. King's Collector. Var.

Mrsutiflora. King. *Steals tomentose exte*: sparsely
villous; disc small: the cymules larger and the longer
and narrower than in the typical form.

Perak ; Changkat Juriu. Lu Wray, junior. The whole plant when
dried has a characteristic grey colour, : bis circumstauce I have given
its specific name. Sect. II. *Peut'aloba*. Anthers with a broad,
usnally terminal, peudage from, tho conuective ; but nonb from the
cells.

8. A. LAKOEOLATA, Wall. (I '■>■> Hook. f.)

All parts, except the inflorescence quite, glal

ios pale. *Leaves* shortly petiolate,
elongate-i&iici

acuTTiinato, the base much narro. ;orvcs 9 to

slightly curved, prominent especially below, secoi

verse; length 5 to 8 in., breadth 1.25 to 1.7;

bout .5 in. long, 4 to 6-flowered, minutely bn.

nbescent pedicels. *Sepals* ovate, oi k, pubeBCt

ong as the petals. *Petals* lanceolate, acnm illous t

niiddlt • i as long I

from (all glabrous disc; anthers linear-1

lanceolate terminal appendage. *Ovary*

sub-globose and, like the rio style,

villous,

minutely pubescent, *35 in.

in Ann. Mus. Ltigd.

i. 648. *Tent, lax*

Surd. Mag. Zuo. Bo

Penaug

Ior.

A a

o 8 feet high :

cb more frequently truly hernia pi <

others. The Suinatran species *A. dasypyxis*, Miq. comes very net but has longer race- ad more hairy fruit.

In *dlt* *Ua*, Wall, there Is a transition from *Pe*> to . Many of the specimens of *A. lance&lata* have the 8v ten «olate appendage from tLi of the connective: oil (Curtis'a Penang specimen) this appends and broader, while from the- apex < fher there is a rudimentary apical appendaL

[f, King, n. sp. A small glabrous tree, the branch- lets usually palo brown. Z membrane rtly petiolate, obliquely jlate or oblanceolate, shortly and bluntly acuminate, irreg- " larly serrulate ; main nerves about 1 - 3 pairs, rather bold ; secondary nor itly promineii 7 to 9 in., breadtl u "5 in. long, several toge-icr, axillary or extra-axillary, about 3 to 5-flowered, with ovate bra rs pedicellate. tie pufeentl Uy ovate, much shorter s 5, oblanceolato, with h I untly aeumii hortner than the petals ; the filaments rice a> nthcrs, slender, rising from a deep, 5-lobed, sliglit- cj tho anthers, short, ovate, with a single very small ovary sessile, globose, glabrous, war; yllindric, glabrous or pnberulon>. nde ovoid, pointed, ihaii '5 in. long, glabi'o\is, lenticollniy ; valve a compressed, pointed. Seeds 2 in eauli valve, Bub-rotund, vrhithish, carnnculfifce*

[•, Scortechini, W^ity ; at low i :ona. high. : nally fchifl much re- zyt, but the flowers, and especially the anthers, differ

ONDENSA, King, n. sp. A glabrous tree; the older branch ial©, lentii g membranous, shortly petiolate, im ral, ^^ eJUiiific-oblongr¹, sub-aoute, serrulate, gradually narrowed below miadle to the acute nncqnaibase; shining abo.ve, cfarker and dull [rib and 13 to 15 pairs of prominent main nc; yte and Lary m transverse; length 8 to

D. *i* stipules stibii ■ in. ary, crowded, much brant' reading, J S in. long, ■jus or g' ; the baoteolee numeronsj ovate, acu' o outer ^v2 or 3 larger, rotund ; th*e inner ■ 2 ovate^pubescenfe on the back, , a littlo longer than

. hontff^ ^ith pah ilions on the back externally and
\g the midrib internally. i glabrous, tho (ilnments
rather

;hy disc: anthers cordate, with a sii; rminal \v!

ovate membranous appendage

sessile, globose, glabrous.

Stylo

ylindr-
not

igna cup-shaped.

Capsule ovoid, pointed, glabrous,

ionti' : valves compressed, pointed ; seeds sub-globular, carueulate.

Perak, ScortecUini, Bang's Collector ; at low elevations.

A tree 30 to 4' . pproachiu. in externals,
jut vyith different flowers.

11. A.FLOiu , n. sp. A shrub or' iyoung br
minutely fulvous-tomentose. *Leaves* meml<
oblong-lanceolate, ovate-lanceolate, sometimes elJi[
nate, more or less obscurely serrulate ; the base re-
per surfa' pt the pubescent n
aoo minutely an y tomentose, the midrib and
of rather straight is verso aei
me 5 to 7 in , breadth I i in.,]
Btiptdes lanceolate, pubescent *an* midrib,
lary, on peduncles 1 to-1'5 in. long, much branched, dii LOUS,S]
ing, many-flowered; bvacteoles ODI OHL ise, j
uiuiipnil, the outer 3 ovate-rotund, the inner 2 ovate, all obtuse ai
cent. *Petals* ovate-oblong, obtuse, Longer
usually reflexed com a deep, pilose, 10-!
expanded and pilose to the apex, contract*?
anthers elongate-ovato, with a single connectival ovate I
pendage. *Ovary* sessile, vi lions, tomeutose ; style*
stigma tru . eap-shaped
pub <5 in. long; the valves blunt; seeds eub-globo
angle long, narrow.

Perak, at low elevations ; very common.

Distrib. Sumatra; Lampongs, Forbes, 1719; Padang, Beccar;
S. 683.

ly a tree, and sometimes attaining the 1

^

of 70 feet. Bu > according to the same COILL<<
> 8 feet high. This is allied to the Burmese >
and Th., which however, b< T the
has much, smaller cymes, and broader bracteoi

12. A. BCHINOCABPA, Korth, in Ned. Kniidk. Arch. II, 360^A
tree, the young bitmches fulvous or iginons-tomentose.
membranous, shortly potiolate, obovate ov ovate-elliptic, abn.
shortly acuminate, boldly and unequally serrate, the basis round
krrowed; upper surface glabrous except the i lerves ;

the lower softly pubescent, the midrib, 11 to 15 pair.-transverse
secondary nerves pale and proi -i/25 to

acute, [argina the acarious. *Cymes* axillary and exi
 Jaiy, sessile, condensed, 3 to 6-nowered; braotedlee
 pub<pubescent. *BepaU* slightly unequal, ovate
 exte tome
 ni

rally, ne as the petaU. 1 ig, obtuse, pubescent
 broua internally. *Btm* iort glabrous
 disc;

filaments longer than the anther, glabrous irrowly o\
 3 co tall terminal wlrli
 iloas, stylo sparsely villos : stigma truncate, cup-
 rom 1, to 2 in. aca itsnsely covered \
 iranched, felted fibres: valves compressed,
 blunt

■ bosc, comprof trunolo ova
 Fl. Im J. pt. 2 ;
 ; Miq. 1. c

sun

lalacca, Peruk, Penaug, at us.
 Distrib.

11 tree 20 to 30 feet high. Sometimes shrubby.

I.ATA, King, u. sp. A small .shrub, t mg bra

entose. *Leaves* itieiumbuous, shortly] lanoeoli

cum ■ ^c, serrul: pper surface glabrous
 ont n< md midrib; lower rufous-pubescent; the
 -Id, as are the tra ■; length 6 to 7 in.,

mall, sub-ses les-
 ioinr? ally.

ernally.
 the lobes of a deep, 5-1 ; fMa-
 us, longer Mian I mall, ova

■ h with an • small terminal tie,

bnlar, villong : style long, oj ', sub-villous ; sti

il iy—pu illy and densely

with uubranched, often linoked, soft, pubescent spines about
 . and not felted. *Seeds* ovoid, smooth, pale, with dark se ad
 an oblong caruncula.

No. ii! ; ■_'. A. small '*corjm* and
comom, but Is.

ich with a tc-Jiiiiit

U, King, ii A shrub or small tree, the
young
densely ffl Rglnous-tomentose. *Leaves* membranous, snb-sessile,
i toiRudate-acummate, seiTuln. base rounded; upper

surface glabrous; the lower pubescent, especially on the prominent midrib
 and 11 to 14 pairs of lateral nerves; length 5.5 to 7.5 in., breadth 1.5 to
 2.5 in., petiole 2 in.; stipules subulate, 3 in. long. / in dense
 axillary braetel meruli. ■ " *pala* ovate, obtuse, tomentose.
 laii' ij aenm i era ally, and (like the sc-
 an m a sli
 minutely tooi
 anther* narrowly ovate, eat out any
 appendage from the connects
 , villous; style pubescent; stigma trunci
 , flocculent-tomentose. red with uni
 ift, pubescent. L spine . in. lousy, not felt
 b sub-t
 Peruk, Wray IS^T

15. A-PACHTCAiifA, King, n. ap- A small lie yot:
 P&le, glabrous, s] lentacellate. *L*
 late to elliptic-lanceolate, aninate, minutely
 ly serrulate, the base slightly narrowed: both
 lower darker in colour; nerves 11 to 14 pairs, thin,
 low; length 5 to breadth. 2 to 3 in.
 pubescent, with thin glabrous edges. *C*
 es, usi: ; -iitary, about 1.25 in. long
 pressed, sepals when ripe into two
 la;
 and pubescent, smooth, cartilaginous ■ *Hi*
 : carancuLite wec-Ja.
 Perat,)rtechini |
 10 feet high. Fresh in
 u of the genus to which this belongs is a distinct species.
 Uovev s a distinct species.
 In addition to the four specimens of what
 appear to be the same materials are, however, insufficient for
 accurate determination.

XXIII.—On certain hycwnidtB from J>

By WILLIAM DOHI

[tceived April 8th :—Read 3rd July, 1889.]

(With Plate XXIII.)

The list includes most of the *IAJ* taken by me in March, 1889, in the I have been mentioned in *da*. And only mention the few species of *iba* which I

; wholly of low-country species (with but a the rt in, the list repre- of the Te Wlum all the spe fcke vallev us to we quite possible th

species were , at the Taw-janng bery a fe ■imtheto near the c The speci wore taken at as camps in the T< ;e border, east of Tavoy. pt one species un bo low one thousand feet altitude, stare of butterllie B with young lar , I lyid in 1887 the great them i _fo, togefch'.

th my (ptions of a few in My which had been prepared for ne of which will s in Mr. de Nicoville'a I have ijeen obliged to commenco v :is yot my matr too small to achieve one of my prin- ts, a proper classification of the *Lye* . So the following

•alizationis must be I. ional only.

led the family into six subfamilies, based chietly on •

To these another must be added, the *Iriphyrina*

'i spec; dudes, perhaps, a few Ai'ri'

Lx oth^r snijaiuilies, tho egg seems to afford

tn, thon
ive

small genera., which

seem difficult to place. The

two

of which I called *t\>*

blypodiaice had

better

HHB^formii .ss of genera and species very
difficult to

In the *Amblijpodias* especially, the *egg* seems to lose much of

lemafic value, and -\ **bo a remarkable** extent in f<-
 alike in <■. ncture and appearance. So it is wil
 that I propose four sections based partly on it, T\ aro
 al
 four d enough, but seem to be connected **a low form**
 Arl g them as it were, as if indie
 cet^ h they all ftp

I,,,
 similar, not 'r **small**,
 tubercular, ind
 out, usually trigonal,
 Egg small **ply**
 cu' Arl ip.
 Tin ts group has
 t!i

yellowish, large n
 vesicular, white or yellowish on with 1
 knobs (often b^at **little** elevated) and indentc
 spaces. This typo of *egg* reaches its extreme
 which the **indentations** aro fewest and co; **while** in
 and cut into I

te distinctness. In *Amblypottia*, :
 same as in *Neoclieriti-a*, and the genns ha<l
sembles the *Arhopalas* in some things, but i^
 a very isolat to. The male has a fif Lh subcostal" branch
 the female, and the middle discoeellular, like the upper,
 and greatly **thicken** bag to be the basal par **be lowt**
 vein. In *Iraota*, another genus hard to place, ther
 cocllular, the **radials** ! a common origin.
Apl j^i-oup have elongate wings, with the outer
 more or less oblique, and the costal

ai.
 wl >d **together**, the cell being i
 (**which** is **but** lit He rounded. **The bind wing** has tv. . in
 ! gouera.

The *Loxura* gi'oup is oi The *egg* is
 large and whit *Loxura*, *Yusorfa** and
JHooxylidasf, it hi

* } ren. nor. DifEors f i
 in having only three sur voina (four in
Loxura)
 t-naork on tho !

t 1 describcti thi as 3/

I, but the name turned out to b
which I proposed Instead uf it, seems I

like apex (which is less than half the diameter of the base), the surface smooth, **with** numerous minute **indentations**, **which**, in occi-
 fectly developed specimens,* are **d** iy hexagonal. The ot ■
 hreo **Indian genera—*I*** ;—are less p-

obviously related to . . . *Cheritra*, and other
 normal

.•: Their eggs lack the **subapical earina**. In
Dmjpa-

tl, wit! 1 indeii;
 ■r than in *i*. In *Suasa* the indentations are large, shallow, **and**
 ial, looking¹ as if **impressed with** a, die.

These six
 . approaching the - group, but have some
 common. T **all** protected The forewing is
 short

■gin erect; the costa strongly arched, the hin-1-
 'iorly. The prehensors are elongate and of a
 pecu-

, and one or two obscure
 lied species . ribeil from Malay ana, have eggs **somewhat as in**
t coarser and without the cornice. This **peculiarity** is as
 ted with otL the imago, on which I shall form the genus Jots, the
 osition of **which** is uncurtain.

The *i* group has much smaller eggs nearly **always greenish**,
i **enclosiag** triangular sp ^{ix:} of **them radiating from each**
 be;
 s roughly spherical, constricted at the base.
 jcul] , which ; ;t, is elsewhere found only in the

The- section is a very indistinct oue,
 !y with the or *Arhopala*
I I.: unities of studying *I* *rus*, and
 have

As a group *ihv.y* seem to have
 bo

rt and broad, the costa much rounded, the veins slender, the
ddwing usually **with** one tail Sw **distingaished fro**
 Lescenfc **discoellubir** veins. So far as these are **i** bio,
 they are very upright, the **middle** one of the fore wing unusually widely
 in these respects from all the succeeding genera.

in lu

he hns called it

tiioso of *my* genera *Ya*

1880, will appear in his next **volume.** **I have**

but it did not turn up in Tenasseri;

.^h or > .red, **ami** the **sonlpturi**

I Imvo found them **-ons**

rare, Imfc are moro **frequent** in some

>ion:illy

J think they are

i!g au earlio]

of development, the *egg* perhaps of so

anc<

It includes four species resembling each other but slightly.

number of -s connect these genera with, the *alaspalas*,
in these. *Fortehafa (gwnesa)*, *Acesina* and (genus,
in) are distinguished by the long costal vein of th
■ :;etnre of th> I fourth subcostal \
separation, aro short, ■ very unequal, and very c Iu
the hind wing is &
the apex, there is no lobe (a tail in x only), and the '
coloured. In Uo costa of .the hindwr iy rounded, thereo
a conspicuou.s lobo and a. tail, and the undersi
The typoi a r -ie, aud tl ana is

the coll of which is

distinct genus- Some rular
spaces. The typical species ha
>ugh vesicular rai:--

and

their inl L.

Th

alar, but I

■ ii is more d<

bructure with an additional tail; the colouring

In the *Arty* ^{!UP ^u}o egg remarkab]

rather small, delicate, 'Iy gveen wil

Iquadran. a the *D*

intei a. This typo of

, and in many nailer and

L have

the c in u£ the for;

| its allit-

branc

They agree with

er from the other *TheclitUB* iu the position of (.Tin i

from the costa, a the length, and *i* blique dir

the upper

vein. A. number of the obscu

wo

■les and tfriangles as in the

du

not know any struct aval points by which
they th.

The '*palas* are extremely uniform in stru«
and on account of their great numbers are difficult to i

•lo to admit generic distinctions -wherever ike

them.

The *TUecta* and *Arliopala* groups agreeo in

the most striking resemblances being that of the prehen
all the genera known to me are short and thick, the -nos of

uei stout, the cheaps broad and truncate. *A ii' uxamiatiou will probably result in the separation of the *Aph?i<eus* and *Loxtira* grou] from these under the name **Apkt**

The sumII .subfamily of *Deud* is characterised in the male the lower organ of the prchensors, the clasps or *harpagones*, **belt**

aborted and iunotionless, adhering to the intr omit tent 01

dumcu. of fci is pointed, and ends in :i >f long ovipositoi

Tlio egg ie very reen, covered TY vy numerous

, bun I >y raife at lines, very delicately carvei

n-like tubercles at their intersection. The **hindv** y

prominent anal lobe, a **single** tail at tho end of **the**

ad of the middle median i

aid its allies belong here, as weli wtes* a i u

Tl

kara and *Lehera*, which have also only one **tail**, can scai

y definition of the eubfamily, nor *Ncov* which

v. like egg.

Tli *B* come near the *Ajjun&us* group of the *Tl*, I lieve, the reticulations being hexagonal. On account of tuuir i

with tl **might** bo jjlaced at the head of the family,

y can be distinguished by the joined costal and first subcostal veins of the forewi occurring iu *Sithon*, in many

I also, I o¹ **in a remarkable** insect described as *II*>,

ire, from Mergui, which may possibly con ect net;

I have described tho *t ilia in*

ate, twice as long as wide, there is

sq; loping sides, and two vertical rhomboid ones.

The flushed by their decidedly concave

3roade&' liddle. The retieni alar, ai

vary greatly ou different par-ta of tho surface. Those on the' sides

coi **coall** white knobs constricted at the base, from which spriu|

cither **four** or six elevated lines, forming quadrangles or triangi.

aces **are he** tl, and in *Xemanga* irregular.

include these genera here with much doubt j they are obviously **tram**

to the I

The typical *Lyca-na* group, containing the greer

majjority of th inily, has hairy eyes, though tho hairs are few

and

a. The *Piihecops* group consists ■

genera, of which the eg-gs of *Megisba* and *Pithecops* have

Uhecops triangular.

nov. nearest *Silhon*, bnt irith rm additional snbcostal vein in t middle diBoocellular is obsolescent *fix* and

a tho costal vein (united witli it in *Sithon*,

type-species Ifl]

quit

I, and there ia but one tuil (two *in Biduanda*, iu
.as ijlaccd by Mr. Distant).



place here n few genera of dubioB

Jon.

}iculate egg, fl; with *Den**
;cted with the / . which (*N. tes*
-ivo

eggs. The egg of *Spalgis* is much flattened above, and d<
culated with irregular hexagons. J• inn, like that of
genera, can ha^ understood till the

feat storehouse of low forms of
jalgia I place the singular genus *Taral* n) of wBJ

is hamatJot Druce. This go HITS g
like it is probably protected. It may

irrow cell nearer the costa, nud by the oblique ii
?algi\$ it differs in the autenmo, which are much
rap, si- orfc, di

of short, stout ant' gradually tbi
a decided resemblance to those of the *C* with which .
orm. , The eg

tst placed it. The apex is flattened, a little con
late, with a strong crenulated carina projecting
ttwi the margin. Seen from, the
side.

adiute, a little widest at base, the sides smooth, i s
is

idently related to *tjra* and the older and •
of the (Laded in the g~ent

I have made a careful description of *Ttt* ra, i
Malayan species somewliat resembling caught but a single pair
of tins species, and both I believe aro

>> . they *T. hamada* in structure, but tl foo
the female (as well as that of the male) wa
immovable. As it is just po^ j
pecul

ive been due to gynandromorphisni, I merely mei
da as the type of the genus. The egg i
not know. The description of tbi m Mr.
work.

Tli *dims* can best be defined by the pr*
normal in most of the genera, approaching the 1 pe
¹ *Malaie*. The clasps {*Jui*. Unfortunately, they l
ai*o very variable in slia]

iiich are especially valuable in
ul in *Al* ■■ Thi er orgai
like blades, fittii
>int of tlif abdonn lach one
a human Femur oierus, (ittin_
irface of the uneus with a bull- tut

the edge of the blade, tho tip, which is elavate and ends in ,
 ■short hook nofc visible from the sido, reaching the base of the
 tineas,
 ruction varies bat little in all the genera and species of the
 kable feature of the subfamily lies in the fore tarsi be-
 in both similar to the middle and hind cues, just as in *Fmniio*
He? This ftjso occurs, according to Jfr. Trimen, in
 ccr

uch as *Arrugia*, which from his account of them seem
 to this group. The legs of *Gerydu** are curiously flattened
 in

us and *Parat/erydics* are long and slender, tho
 of typical *Logania* have the ends of the tibiae swollen. One or t
 s hitherto included in this last genus have the legs Blightly flatte
 short find stout, the tibiae being thickest in the middle.

I've to form a separate genus^ for which I propose

It will include *L, mo* *ta* and *Xr. sriwa* (grobably the
 tea), and one or two rar< ■ undescribed, ranging from Pegu
 to Borneo. Since the preceding remarks were written, I have taken
 a e *Logania* in Upper Assam.

is usually very much flattened, but, iu *Logania* and *Malar*.
 ire than twice as wide as high, as in many *Ly>*
yds and a few *Allotiui*, winch have much flatter eg
 i amber of strau^ - JaAsrat ho.rizGU.f-

th. ing to the species, either simple or broken **H**
 into
 lese te ■ placed in vertical series, one **H**
 above t a.a.l

j;i> of the egg, and indeed the egg itself
 if ied, (tlu) appearance of a cogged wheel. Thus the
 usua

"■ give place cm the outer border and horizontal (the
 ear in 09) lines, a remarkabl Tho upper surface is, however,,
 obliquely reticulated wit lelicate raised ^rise.

This vertical reticulation is more pronounced in the *egg* of *Li lich*,
 as might be expected from the strangeness of the insect itsel very
 unlike that of other *Lyccenidts** It shows, however, an unexpected
 ee to that of *Logania* and *Taraka*. The egg ia of great
 siz , overlaid with white, shaped something- like a section or "
 dr

iiun, bat somewhat widest at the base, the height, breadth L at
 base being to each other as 9, 13, and 15|. The al reticulations,
 the hues turbiuate iu th iannelled, and then strongly carirlate,
 th ing both upwards and outwards, white, its contour even is
 also obscurely carinate. The sides are crusted with white,

indented, with about forty-five vertical ribs, slightly *vc*
and even (very rarely) anastomosing, extending also over the 53

outer part of the bane, the inner part being green and minutely
 r* enlated with hexagons. The prehaenors I do not know. **The**
 fore-tarsi are, I believe, the same in both sexes, aa in th.

Liphyra brassolis flies slowly with a rlistin-
 and an uncertain circling flight, hesitating a long ag.
 Whether it is, as it seems, a *jn*< vcies, or t h
 it flies chiefly at twilight and so escapes capture, I do No
 one would ever take it for a butterfly; few moths are n; ily
 moth-like in flight. It is probably the oldest typo of *L* ug,
 and unconnected with the rest **except** through auch ;
 us aa *Taraka* and the smaller ***Geryd***
 presentative of the subfam < and
 its
 rently African.

A word deserves to be spoken on the subject of green
 ice it seems one little understood at homo. Early in the
 century
 Horsfield professed to have found a green female of the
 Javanese
Arhopala mymolphus, the true female of which is ntly, Mr.
 Distant has described, as the female of *A. farquharii*, a butterfly bright
 ©en over the basal half of the wings above. Now, **the** ale o
qukarii (perhaps the form described as *J* iolet
 blue and one of the most constant of butterflies. Of the green
 fo
 mentioned, I took several specimens in t ,nd in
 Borneo, and they were all males. It is ribed,
 perhaps identical with the HorBneldian form.

Grant Allen shows that, while greenish flowers are
 really green flowers are the most recently d&veloped oi mon
 most conspicuous. Very much the same thing is true le green moths,
 like *Actias*, *Geometra*, and *Pachya*, by their colouring, which is
 common to both sexes, and are quite hidd when resting among the
 leaves. Such seems also to be the case wi

a *eryx**, a lycamid which is greenish on the

v

■ possibly be .the case with some C< But I
 hink, the latest developed colour amon
 the roost conspicuous. No one who has not Bee
 brilliancy of *Arkopala farquharii* or fe gr
 ; jungle. The brightest of the metal lie-blue baf
 beside them, It may be confidently asserted of all such
 but unless the *peciefl is protected, only the male is grec
 .'Aopfertw have sometimes assumed green colours as *m*

* The underside is green or greenish
cfise-i y utiigiial in Eaatc



I orange, and the female shares in this useful ornamentation to some extent. In non-protected butterflies the green is confined to the upper side, and is quite invisible except during flight. In the *Jjycmmdm** it

is in many, , in some 2 -' and *Massaga*^f in a few *Arhopalbs*, and in *La* -*arakafa*, a rare butterfly I discovered in the Mala}' Peninsula and named after its emerald tint above. Among all these, whenever the female is known, it is blue, orange, black, violet, or any other colour but green. The conservative and, in butterflies, unadorned *sex*, has not yet acquired the latest development in colour. It is also remarkable that the green colours seem to occur when; the

is is: dominant. The Malay Peninsula and Borneo form the chief development of the genera *Arhopah* *fjampidm*, and it there. Mi. <■ of the green species occur. The out!

North-West Himalayas, and the Timorian islands, are all blue. In *run*, the green species are found only where the genus is best represented and most vigorous. *Zephyrue* *jpavo*, a species found in the Bhutan and Assam hill-ranges, remote from the regular habitat of the genus, has, I discovered, the male blue and greatly resembling

■ in the Western Himalayas. The green and orange

also occur only in the heart of the *Ornithoptera* region, these red and green butterflies also apply in some degree to certain species of great brilliancy, such as the shining coppery *Id*« ■ and the fiery red of *Thaniala marciiana*. It ought to be found that these colours must never be ascribed to a female without examination.

riubraniiiy THECLIN^E.

Arhopala (.<

ARHOPAUL (NILASERA) CENTADBUS, Hew.

Mergui, Myit

2. ARHOPALA ANARTE, Hew.

One male, Myitta. This is the form described, from Sumatra according to Kirby, by Hewitson in his Cat. Lye. Brit. Mus., and is

ai'e fji'eeu above in some lights, e-
The all< IB *AIBO* figured by Hewit-
: mistake. This *Ifwch*- 'iiioog fche swiftest and
a, and the bright colour of their upper side is only seen during

t 3J

•■: *rama**₁ Distant, but with only four subcostal veins, instead of five. From *J* forms in the upper radial vein, which arises from the anterior cell, a little beyond the end of the cell; in the cell

of the hindwiog, and in the markings of the undei-aide, TV» I not annular but
simple and linear. Sexea very uiUike. Type <>6&i*da, Hew.



altogether differed a the fi nn the Mal;i
Peninsi.

described by him under the same name in the Dinrn. Lepid wards,
the male of which has been named *aqnis* by Kelder, who
recognised

Hewitson's error. *An* one of the moat beautiful of J
butterflies.

3. ARHOPAXA AGKis, Felder.

One female, Mergui.

4. ARHOPALA ANTHELOS, Doub.

Morgui, a very brilliantly coloured species. '

AfiHOPALA SUBFASCIATA, Moor0.

itta. The cosi L apical black ia sona
female, which does not dill 6.

AHUOPALA

Male above light brilliantly m . outwan
slightly violescent and less resplendent ; ader black
marginal and costal line, hind wing blue from the
median, a marginal black line. *Below* rather dark fneoou.. brov
markings darker, bordered by slightly paler lines, only the basal s
annular, the other like] ieses, so (). /

a transTerse one below it, and one in the base i

The transverse diBea'l band is rather bn
lied and compact, the first small, close t

est, the fifth and sixth dislo< inwardly,
marginal row of obscure dark spots bore!
obscure paler touches. *E* with the ba\$
annular, a transverse discal series i
semicircle, all somewhat annular, none app ;ial
streak; a submarginal row of obscure dark *at*

I paler, a slight metallic greet k in tl ian spa la
similar band from the lower median to
dered with bJack. The lobe is small, blac)
ud of the lower median and s

bna, bui

tails ; the outer margin is regularly rounded without undul::
two inches.

itta. In the colour of the npp

sembles *A. lyca*, , a small species and

near *ayelastus*. But tl more

tinotly metallic abov< ow, the trans

i Bpot of the forewing abscDfc, and *the* g
more fuscous and less rufouB.

ARUOPALA AQELASTUS, H(

A cor moni specie

, Aleigui, U^i

•*

occu^M 'which may- or

1889.] W. Doherty—*Certain Lycoenidrt* *Lower Tenasserim.* 419
may not be distinct from it Mr. de He has
pointed out to me that on the fore wing¹ of the male of the alHed A, *an&i* i*
there is a curious clouded disc, perhaps of the nature of a sex-mark.
This is sometimes just traceable in *agelasius*.

8. ARHOPALA TIHAKAJ Ft
Mergui. I obtained several • species of this very diffionlt group,
not having access to authenticated specimens of *the allied species aroa,*
atosxa^ yeiidam, etc., I am unable to identify them.

9. AfUiOIWLA META. TA, Hew.
gui, Myitta.

LA DAVISONII, de Nice, MS.

"yitta, Tavoy. This species, which ia quite distiuct from
¹ ng one, belongs to a most difficult group which can hardly, X
beQiiU : without a careful study of the prehensors.

■ is one of the commonest and most ubiquitous of Malayan insects
and is abundant in Borneo.

11. AKHGPA LA UU£S3A, n. sp., PL XXIII, Fig. 6.

a bright cerulean blue over fully half of the forewing, i
ape>. ly, tbe cos (a and outer margin moderately, and the
veins
Iff. derly black. Hind wing with tho cell and extreme base of, tbe lower
with blue scales. *Melato ligi* vn, the costal
apii , including¹ the upper half of the cell, and
with pale violiat, the markings brown
•a, only the basal ones annular. *Foreveing* w
spots in the cell, n double one in the baBal part of the
sr ii a very broad compact dark transvt baud
u from the cosia to the subuiedian vein; the apt whitish
/ with basu 1 ann laJ¹ spots, an irregular o ,nd
'ie cell, out ward ly acuminate, and a very irregular transverse discal
d of wl^ first and second spots are compactly united with the
cell-spot, the other five small and separar irregular
outer discal pale fascia forming a large vio »asfl
, the disc also clouded with whitish -j ;in obscure
sub-
1 lint- of; let luii ie marginal line dark. No metallic
,vmg distinctly undulated outwardly, hind wing
wif tmduln Mxpanse J^ iu<
I know m bling this.
has m a lobe. 'j on
of tbe
ory unusual.
, n. sp., PI. XXIII, Fig. 11.
D) ve rich uniform purple blue over fully half the foruwing

ds of the hindwing. Forewing with the costal border ^

lower angle narrowly, and the apex widely hi Hindwinp
costa widely and the outer margin narrowly black, the blm
beyond the Submedian vein. L

but slightly darker, bordered by lines a *Yii*

on the hind wing annular, the others with straight be

rh three spots in the cell and a uniform band, unbroken
but slightly carved from the third subcf the lower mediau vein, the
base of the lower median space and the up] I basal part of theii<
no-median space dark, separated distinctly from an outer pale area in that
space; a aubmarginal line of obscure darker spot red by a
alight-

paler line. *Bin diving* with the basal spots small and well separat
a streak acroRS I of the cull extending-to the sul.r

a transverse discal band dislocated outwardly below

vein, contimious in the next four spaces ; subi

-the forewing, a metallic green fascia from the lowt sub-

median vein, and a touch of it in the lower median s The hindwiuj

is distinctly undulate outwardly ; it has no tail and but slight traces oi
a lobe. Expand ch.

Myitta. I know no species closely resembling
coloured butterfly above, but the underside is unusually dull.

13. AEHOPALA 11IKABELLA, n. Sp.

Male above bright violet-blue, dull viol« nio lights, over
tive-sixtliB of the fore wing, the marginal 1 and tie

«al on both wingo. *Below* light fuscous, glossed witi
markings large, numerous, distinct aud^ on

brown spots, paler in the middle, set in. u

parenthetic lines. *Forewing* with the three usual celt spots largo, a double
series of costal marks, the transverse band mucl nth<

lower radial space (the fourth) extruded ; marks below tin

cell, two submarginal violet-whitish lines, the inner iunular, the

outei
.straight, obsenre. *oing* with the baaal spots annular, the
basal

costal one obsolescent; the transverse discal .band wibh only the \ of
spots continuous (the second touching the terminal cell-s^ot v large,

pai-enthetic), the others irregular, the fifth inwardly ; two

submarginal lunular lines,

ee email black spots bordered tetallic green

TOW irroratod wi ria. *Female* with t]"

i coveng only half the forewing, and the i rn tl

a (basally) and the upper subcostal almost

dark border rather wide. Both soxes have a Blende white, 1rJ

and a small, distinct lobe. Expanse 1\$ inch.

ew, from the Celebes, but

ISf- W. Dolaerty—*Certain Lycienida? from Lower TeTiasserim.*

421

seems to be darker below, with a broader black border above. From *acTwlotts*, Hew. it also differs in the broader black border, and the apex of the hind wing below is not lilac. The blue above seems also darker and richer. From *aida*, de Niceville, it *Jff strong violet gloss and the large and crowded annotations, plying most of the cell of the forewing and extending thence nearly costa, on the underside; the upperside is very similar. The tip of *A-dla* was omitted by accicU

14. AKHOPAIA BELPHCEBE, n. sp., Plate XXIII, Fig. lfi.

above light, t-q^her dull purple-blue over about half of the pwing, the dark border widou the hind wing. *Below* much like he costal markings of the forewing are absent, and the spots nearly qjinular on th< i id entirely so on the hind-wing. The three upper spots on the fore-

liy oblique, the next two are united. *II ih*

'■i the three basal Bpots small and crowded together, the others large distinctly outlined with violet white, that at the end of the cell irregular, producod outwardly to a point in the lower median space as in *A. duessa*; the transverse baud annular, nearly regular, composed of slightly united pairs, the middle pajr out. of line; a double line of obscure pale submar-giiml Innules on boSfa wings. Expanse 1| inch.

Mvitta. This species is something like the female of the preceding bnt the blue is paler and more lilacine*. It has no tail and scarcely any lob< ^jp some resemblance to *A. agesias* from Borneo.

t1A ^A ALBOPUNCTATA, Hew. ^

Myitta. Tii.s specie- bet and from the Philip-

pines ifnl nudesc)ian epeoies, mimios the geons *Jjar* 'i on the upper and underside, resembling *L. dpis* aud

its allies A ala (*critala*, Folder, from the Moluccas)

mimics most fait) if ally.

»PALA AMMON, H>

The Tenasserim form of this beautiful little species may be Tom the Malayan one, but.in the absence of an authentic specimen of the hitter I cannot at present decide.

17. ,AiA FARQI istant,

iistinct from *eumolphus*, not, as Mr. Distant says, on tv dislocated *t* runs verse baj^kof the forewing, which

often o

oi ground colour varying- in different places, the spots small and distinct,
ilour while the anal green ftrefi is usnally obsolescent. The female of *farquharii*

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h

W. Doherty- *lin hycamideefro*

is bright blue over fully half the Fore wing, its edges brown border on both wings, darkening whereat borders <>■ -tits the blue sabapically. The species ia extremely where, and is abundant from Tavoy i to south-i Borneo.

18. ARHOPALA HELLENORB, n, sp., Plate XXI

Nearest *eunwlpus*. The green of the upperside is raH^ tinged and the dark border is somewhat narrower the forowing and much narrower ou the 1 than a **third** towards the base of fcho low wings;* uonsly marked with whitish, be hind wing in which the transverse ma l'--..

tiucfr, and aero n an obscure disral 1> , metallic green markings are << rent. The dark ma in *fa* ■«, from which it seems quite he local Tenasserim form of *eunwlpus*. Ono male, Mergni. Expanse

h.
19. ARHOPALA MAXWBi.Lir, **Distant.** (?).

l ami unt^l r, as Mr. de Nicevitle si

taken by Mr. Biirge Er. Distant as A the female of *farqahani*, or whether, as I thought at first, it is the female of fl male taken **by** me at **Wyitta**. This is a dark violet-blue butterfly, very mnch like *ngahas*, \ -angularly like *fa*

r, by the large distinct basal spo large costal spob **of tfre** fore wing opposite that at the end oi by the first four spots of the tliseal band forming a mass Neither by the figure nor the des< i oau i it

from *mcucwellii*. But Mr. Distant is much more likely to have o!

is abund: u this species, v.

y is probably correct, In that case my male romains

unidentified**

I. ARHOPAEA (SATADBA.) AttABA, Hew.

<v

21. ARHOPALA (SATADRA) AIDA, de Nice, MS. Mergui, a very common species. In typical sp *iraA rama*, **the** tail and lobe ate wel

illey tend to disappear, so that it would be hard to

22. MAHATHALA AMERIA, Hew.

Mergui tmon.

- 8 ml have learned that Mr. de "
as *Arhopala adore*

Tht

and t ios were both, I believe, founded on a i
of uncurtain sex and with the tails broken off.
mle i females near Lulate tails much* like
differed J'rom that genus in the L
indwing, in tl hich was covered with

11 imp butterflies), and in the more undid-
of tho Imuhving. - it a most peculiar appearance. Bu:
insect has. >n a tree-trunk, a marvell i to a
■!i of li ilsir outlii a to this effect. **Miini**
; sign of great flexibility of structure and such
fc be judged by a- is than others; so that it is doubtful
whethi ad.

Hew.

PS, Cram.

r. Distant makes no mention of the **singular** scarlet costal a
the base of both wings below in **this species**, t-:

I by Cramer a >Jarfc, **Tin** **siouaUy**
jiucli *lean* mark'. . thu fore wing uf some of
tho

f this g ■ shown mo.

:ui. This speciea is l pe of my geuua

■■•.i to publish before Ion;

jhtly <\ t form r in

i

mbawa. For n partial desoription'of *Flos*, see

Mj th Sikkim specimens.

27. ARTEQAt, n. sp., Pl. XXIII, i

-,e **azure**, darkening outwardly to violaceous t>lne,
quite violet in some j the fo iue **occupies** less fcha
\i of the **surface**, the **black** border reaching the upper angle of
tho

■ unusual l .tp the hind-margin. £ **with**

•c subcostal veins to the **submedian**,

G black border wide.

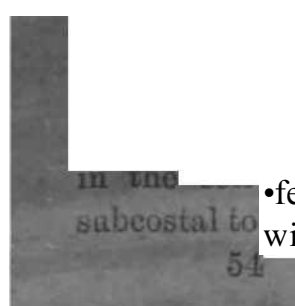
violet, a large triangular

violet-

in *Tsh*) on the oosta near the apex;

•feit let brown t vans verge bauds, edgod

with paler, ouo



second across **its** end, exten> Erom-tl |
wer median j the thii\i LO, unbroken, **wit** "bt

to to the upper median, contini>
lower n ; margin, except at the apex, d
b Hue. L ,ig very deep clioculntu 1
it from the t a dark i **rea**, its
margin violet-^v 1

with. viok'<

rather

IOUS .s

I black ocellus

■ **aiedi**

>ne on the lobe, the green extending to the
i outwardly, the hiudwing

■Uort ta .0 end

hort tail i

D

Q

group. Two males, MuryuJ.

28. H BAQBL

SURENDRA AMISENA, HeW. (J2«{W

McTL'iii. Myina. **The** femalo agrees well wil
except that t) **of thi**

mt of **hia** figure of
figure in **bei**

acunn'nato and slightly fi The blucP"Rrea it
occwp^ tian a third of the
i luilf of tie for'

liindwing. In this species

tower median voiu, but scarcely more than

dlo median; the **lob** i smaller ilian ii

fem: > tails, **both** slender, the outer **tli**
p., PL XXI f

ieh **pnrple-bli**

ie upper i f.

On thi

upp **bof the** cell dark; a >w **blac**

of the forawing mucli darker and th>

wing I

Idlo of tlio cell, a larger one across i 1
line of joined lui •ostal

iOW til

narrow

•'.] W.
D,

of a broken, duU

Jo on the d ical and dark
ainal ground; an obscure metallic patch in the lower i

-lull *lv*- \y paler civ middle
•k area of jl

lian spaces on the disc, that hindw

)ss tho i

■ the hind ma

. whitish spot basally *he*

ad snl

!JG inner transverse line united, o

one consisting of pale line

. a dark band, in which there are two di

second line ch. This sp

∴ tt the end of the middle median v

erage; there is no trace of

te in either sex. The egg a

larva is a very distinct species, and the male

try ed.

several females taken on ,
at 1,500 ft. altitude.

Loxura Gfroup.

Cram.

TATA, Hev

i, Distant, (/ . Ifoore).

>mou. I cannot find any consi

id Perak specimens. The genus

living the third subcostal vein (aid ridged

its termination) and a conspicuous se:-

en the bases of the costal and o

are extremely similar in the er=

;iy sj'Mtcm of

to in

-jr.

. (*fabricii*, Sloore). I find any

constant difference b<.

113.

■" this little species, *Myitta*, A

c, but whether it is

this, I am usual lay.

"W. Doherty—

3fi. **BIDUANDA KICBVILLBI**, n. sp., 1 r. 16.

do, above, (much riel iuer than in *B.*
in the s of the- forewing, auarrov

II, 3 borderer! w ar
'ly>

s well if tlits tails.

the markings more ru: -;isal spots simple
rot annular, the transverse di iand and the outer mnrgin o'
fore wing rnEous brown and f e

. the
metallic

on ar< ling unbrokt- o th
al Jinc

(her

I nar i I tie Nieovillc, whose great
on we

Indian butterflies, equally imp(- the which
it

'ns, and for 'tho impetus which it *is* certainly destined to givo
study of insects in the East, is now in progress.

DA scuDDERn, n. sp., PL XXIII, Fig. 14.

All' ' somewhat *m* female of
ark fuscous, an orange- occupying al
aixi to forewing, including the lower auge of the cell, and the
from the base of the lower radial to below tho lower
somewhat . obscure violet-blue subapical area (
any light), not reaching the COB' outer
margin is also ti. violet.

iolet area from the cell to the outer margin, l

and tic edian vein, from ti;

inner part densely in

; suba la

chiefly black i

name the species aft or . H. &
chi L*at nun if whose m .-ent. w
hind bnttei-flififl I have just had the g* '-tune to n ith.

Hyiita.

Aj

39. A **IDIA NAEAI** sf.

The M

found in *i*
the North In<

Ponii
ii-icity.

a blighter, liohe

40. TIOHETCIU AOTE, Moore.
Mergui, Myitta. My single female (Myitfca) is remarkable in
e white spots on the lower part of the hii lited into a sb
ad, Buck as occurs in some specimens oi
Fab,

BISTDAHARA PIIOCIDES, Fab.

One ■ Lergui
43. Z LUS, Fab. (*etolus*).

■ a.
\ AMBA, Hew.

Myitta. Differs from ia of the for<
d the umc.: ter bin. he hind,wing.

45. B -A. EUYfiUS, Oodfc.
Mergu" ba.

46. CIILURIA OTHONA, Hew.
ta.

CHLIAEIA IERGUTA, n. sp., Pl. XXIII, Fig. 2.

,e, dull indigo blue over half I Ing from

L almo angle, and cvi tie liindwnng fj- ■ upper
bmedian \ ith :i marginal
white



I with white > arl grey, the
nderly light fulvoas brown, both :ik across the end of the
cell, and a ter fa! .*&ts, transverse discal fascia,
very slenderly and whitish lines. On tho
forowing this is in

ly ^ ng- it is dislocated inwardly below
the uj a below the lower median.

final line, cilia dark. *Hit*, mostly grey,
ly tinged with rufous, the lower and anal j hit-
witli two submavginal lunlar bands, a large black spot, tally
out metallic scales, betwtt -ver medians ;

lobe black ed^ed with white, a 'slender black edge-line, cilia
bus;illy

whitish, outwardly dark. Tails much as in *oih&na*, the anal one longi
A single male, Mergni. The species somewhat resembles *Zellus*
fth lied by the short tails and the abst

It has Btill more resemblance to *fr*
the clo]>pressedL ud first si
i, though its long narrow wings give it quite

herty— i

49. DTEINA DONTNA, Hew.

i, Myitta, males only.

DACA Horsf.

Mergui. The spdc semble

respects. As there seen-

tie) : -b substituted Mi\ de Niceville's ui

51. Til A H ALA MA RCiKh l)'.
Mergui.

HORAGA ONYX, Mooro.

Mei Clinens differ from Sikkii
which is greenish yellow

vn. Only

53. A -HiTA, Hoi-sf.

Mergui, Myitta.

54. Cum : ICA, F<

M^y specimens are very inconstant, as ia usually tne
genus.

Subf,

Genns A -j nov.

ARAOTES LAPITHIS, Moore,

[Mergui, Myitta, scarce.

DEUDOEIX EPIAUBAS, Moore rhas).

My it I

hi. RAPALA A, Mooro.

Morgui.

ACEA, Mooro.

Mergui. An abnormal female was taken with the *i*
baud below wholly obsolete on both wir

Two males, Myitta. *I* nes h.
.otimca has not a large black patch of mi
above.

Subfamily PORITINiE.

Genus Pi

In this genus the upper radial of the
end cell, so that there is a very sho
uiddh. **cellular** is upright and very slender, tL rob;

In the hindvriin--

'Iso very Blender, the *am*
in is OJ

the for

' cr rounde

, markings of
(he :-niar&
i on

3 small, .

,i which the **but**

I '

figure. There ia

in dark patch below the col¹ aud .a
maoul

ii. Mo

VA, nov.

'iion. The males are remarkably variable ; mi

T I- ikon

i bhoge rosom'

I, wholly

k and a solid
and di

Lbapic\$1 band. Tliennd

i third, of i he

;H small b] :

om the cell to the hind mi

intern-

xo wi

i of the c>:

■ell and a va

subapical ba

blue area on the hindv,

bnt

>as di^

it of the forevri

Genus MiSSAGA, HOT.

cribed this **genus in**
:tle of *i*

the type being *M. 61*

high

itflon.

ville to oi

ly did. Babs

me as to its

llid;ir vein ; the middle dis-

/ oblique, the loi

G3. MASSAGA POTTNA, Hew. (? = *Simiskina fidgens*,

MASS

velvety black with the following i*ich blue markings
 /ing accordii 1'y'¹^ one below the extending
 ices, one below *the* internal vein, with- a spot
 : he or. **hree** spots a little beyond the end oi
 cell, its lower quadrate ;.a submftrgmaf e
 spots, the lower one large aud cordate. *E* i longitudinal
 mark in V< -mo-median space, from fche base lirds to the o
 margin, two diacal spots in the nest two spaces, marginal crescen
ho subanal one large with a streak outside of i
 ab median vein. rufous brown, brighter than i
 th an obscure darker rufous streak across the on
 .'kor rufous line across the disc as far as the lower
 jdian, **red** outwardly *by* a darker bluish-tinged space, an outer-
 discal obscure luuolar line, bordered inwardly by a paler bluish one and
 i broad pale space, which, is conspicuous and somewhat
 :ie apex. Hind margin and interno-median space chiefly
 dull ochn shining; a bright reddish TV l lino, cilia blackish.
Ui, A costa dark **rufous-u** *fhp.* rest paloj
 a brighter rn.fotis streak closing the cell, a similar discal series of Innules
regularly placed, an obscure dark outer-discal Innular line obsolete
I subapically, bordered **both** inwardly and outwardly by a paler
 bluish
 ieu by a brighter rufous one; a bright rufous marginal
 line bordered BU- by slender black and white ones, cilia dark,
 tale, above bright orange-tawny, the apex and outer margin (not
 the costa) -widely blackish, the ends of the three median and the inter-
 nal veins brown or even orange, the orange area almost senjicircular
 »outwardly; the hind margin and the basal half of the interno-median
 more or less irrorated with black scales, which also
 enter the base of the cell; a marginal rufous line, the cilia darker.
Hi / orange, gene ally strongly irrorated with black, the
 veins
 Ios. oscure submargial band of darker quadrate spots; a rufous ,
 margi lia darker. Some specimens have almost
 the
 ale nppfir surface ©orange, except the apex and margin of tho fore-
 wing, brown, much paler than in tho male, the
 markings darker ferruginous, resembling those of tho male, but more

One male and five females (only one fresh), taken near My it in.,
in

district. The male differs from the male of *-pediada*
in
t ing the markings larger, clearer, and not bluish-green, but
deraido is less dark and uniform. Both sexes are more
falcate



than .in *pediada*, and of larger size* -The female generally sits on a leaf
h half-open wings, and might easily be taken for a small *Ci* foa,
or sometimes for a *Loxura*. In any cns/» its entir* e from the
usual colours of the group indicates that it is likely to prove a mimic.

The female is somewhat variable. I Jiavo it will
turn out conspeific with *T* -from th< v Peninsula—
which I only know from TTfwitBon's figure.

It seems also probable that the insect named by Mr.

Distant

Igem and placed by him in the *Mnjc* identical*
with or at least very closely allied to this spec , ho
gives-no description of I ins, merely two particulars in.
which, it is true, it differs from all Eastern 7 with
the *P-* and with most otl Q£ the
faithfully representa a wither worn and faded female of

The egg differs from that of / the he air
ilations very regular and delicate ; it has the sam*
It differs wholly from the eggs of tb rn AV which
round in horizontal section and without the slightest i
tion.

Subfamily LYCJEJKIJ&JB.

*Genus of uncertain po**

64. CATOP(ECTLMA FLECUX-J, Prn.ce.

Icrgui, Myitta.

Lyc&na (.

65. CATOCHRTSOPS STBABO.F

Mergni, Myit-

66. CATOcmY SOPS TANDAVA, Horsf.

Mergui.

67. CATOCHUYSOPS GNETUS, Fab.

Mergui.

68. NACADUBA ARDATB?, Moore.

Mergui, Myitta.

69. NACADUBA ATRATA, Horsf.

Myitta.

70. UTACADDUA PAVANA, Horsf.

Myitta. Like *niacrophth* Imt with tho lines of the unt-
slender and distinct, the basal ones absent.

* Mr, Distant has since informed me that this ia not the caae.

71. NACADUBA VIOLA, Horsf.
Mergui, Myitta.
72. NACADUBA DANA, do Nice, (?•-
Myitta.
73. LAMPIDES *J£* , Fab.
Mergui, Myitta.
74. LAMPIDES SUBDITA, Moore.
Mergni, Myitta.

LAH FIDES BOCHUS, Cram*

I am not aware of any difference between *Jamides* and *Lampides*, and think it likely that tho former genus will have to fall before the latter, which occurs earlier in Hubner. It is to be hoped that no more species of this genus will bo described without an examination of the *preliensorcs*, which are fortunately of great diversity in the different kinds, as if to counterbalance their puzzling- similarity in colours and markings.

76. POLTOMMATUS BiETicus, Linnaeus.
Myitta. . 77. TAUUCUS
PLINIUS, Fab.

Mergui. *j±±~* *jmm*

78. EVERES UMBBIEI, n. sp., PI, XXIII, Fig. 1.

Male, above black, tho cilia of the hindwing and of the lower jle of the fore wing -whitish, except at the ends of the veins. *Bt* grey-white (much whiter than in in *E, hrfa*) with tho following blackish markings, tho discal onus quadrate. *Forewincj* with a streak across the end of tho cell, a broad straight erse discal band, inwardly dislocated below the middle median, the lower part outwardly oblique, outer margin widely dark, containing an inner lunlar and an outer slender whitish fascia. *Hindwmg* with a large subcostal, a smaller cellular aud a minute abdominal spot all near the base, a streak across the end of the cell, and a broad discal transverse band broken into four juadrate masses of which only the upper two touch" each other, the first covering two spaces, the second (strongly dislocated outwardly) three, and the third (nearer the base, oblique), two; the fourth being a small lunule between the submedian and the internal veins. Outer margin broadly dark, containing a row of whitish lunules (the subanal one orange) surrounding black spots of which the two subanal ones are touchod with, metallic groen. A whitish siibmarginal and a black larginal line, both very slendor, tho cilia and the tip of the tail white.

The broad, unbroken, quadrate discat bands of the underside easily distinguish this peculiar species from *Everes kala*, 'de NiceVUIe, which lias rows of round black spots instead. *E. kala* has somewhat the aspect

W.
Doherti

of a *Zigera* and *E. umhriel* that of a *C* w, Bt y tm
out to be mimics. aboveⁱ nl ha the
Naga Hills froi.
tic, while *mnbriel* is a purely tropical sped
in Tenasserin, The by ecimcn of A
so that these two species bavo wholry lost the usual blue
allies, in this resembling *Everes* which
to occur near Myitta (though I did not capture any), diffe; nib
from the typical *Everes* in having the discoceUu of both wings
meeting at a pereeptibi
retain the gem,
malea of *wmbrit* 1 ley, and observed
others.

79. EVERES PAEBI Fab.

Mergui.

80. EYE RES PUTU. Kollar.

Mergtri, Myitta. These two n\ wirl. 1
n both in the islands of Sumba and Sambawa, east of Java.

81. ZIZEBA PTOM^A, Snell.

Moi^ui. This also occurs in Sumba and Sambawa.

82. ZIZEKASANGRA>Moore.

Jiergui, Hyitta.

83. GACJTALKT.Snoxns, Godt.

Mergni, Myitta. In this as well as in. the preceding g
eyes are but slightly hairy.

1

84, CASTALIUS tiTHios, Doub. Mergui, Myi: 85.

CASTALITJS ROSIMON, Fab. Mergui, llyitta. 86.

CYANIRIS TRANSPECTA, Moore. Myitta. I am not sure
that this species is distinct from j 87. CYANIRIS

FLACiDA, de Nice. Myitta. 88. GTAWIKIS MEL^NA, n.

sp., PL XXIII, Fig. 13. Male, above, dark dull blue,
respleudeut in some lights, the blu extending over
less than halt' the saiiiieo of th extending above
the upper radial vein beyond the cull, the blaii
very large occupying thu upper part of tho cell,
angle, and extending **over more** than a third of the

hind margin, < hindwiug the blu occupies hardly more than a third
of thu surface, and oes not approach either the costal or abdominal
margin. There is no hitieh patch on the upper surface. Cilia
whitish. Below grey-wl

with a slight silvery lustre. Forewing with a streak across the end of the cell and a cm-rod diacal line of six dark streaks set in paler rings, the second, third, fourth and fifth outwardly oblique. I sixth removed submarginal row of joined ocellus-like spots, consisting of a dark enclosing a pale, dark-pupilled spot, a marginal with three distinct basal spots, a streak across the irregular series of discal spots; the first very

the second more the first but

basal next to M oblique crescent (the fifth small, the sixth

the seventh large, removed outwardly, the and the internal veins) smaller and

marginal ocelli are as in the fore wing, the inner lunular line more serrate. Female unknown

This species, which is the darkest *Cyaniris* known, was taken in

Tenasserim Valley in February, but it is perhaps confined to higher lands. An apparently identical species is found in the

Malay Peninsula at considerable height, and seems to be *O. jynleana*, Distant (*nee de S*)

The genus *Cyaniris* is better represented in the tropics than is generally supposed. I have myself taken ten species, including *haral* in the Malay Peninsula, eight confined to high elevations; also, seven

in the mountains of Eastern Java and four in the Celebes, besides *C. iodota* (C. looro) in Suniba and Sambawa, and *C. a Sainbawa a levation*.

Pithecoj

of S. ZALMOKA, Butler.

Mergui, S. The species occurs in Java and Sumatra, but is rare in both. It is common from the Chittagong Hill Tracts to South-Eastern Borneo.

90. *PITHECOPS BYLKEI*, Fab.

Myitta, Mergui, scarce.

91. *MEUISBA MALAYA*, Horsf.

Mergui. The species occurs unchanged in Borneo, Java, Sumba, Sambawa. Not being protected like the two preceding

d

Genera of 'ain Posit r

n

BLA, de Nice.

One male, V I have taken the allied *N. tessellata* in Province -
ay, and the Kedah State, Malay Peninsula, where it is

very rare.

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93. LTO^NSTHES LTOJENINA, Feld.

Mergui, Myitta.

94. IITC2EJ<|ESTHES BENGALENSIS6, MOOV<

Mergui, Myitta.

95. SPALGIS EPIUS, "West

Mergui, differing slightly from Indian specimens, the diacal whii patch on the forewiug below conspicuous. The genus is found evexy-where from the Himalayas to Amboyna (occurring in all the islands east of Java), and the species, if there are more than orie, are very han to make out. They live in the drier districts %only, the larva apparent! feeding on acacias.

96. TAUAKA HAMADA, Druce.

Myitta,. I have also taken it in Eastern Java at 4-5000

* Subfamily GERYDINJE. Genus MALAIS, nov.

Differs from *Logania* in the short, thick, slightly flattened legs, ibiee being thickest in the middle.

97. MALAIS SRIWA, Distant.

One female (Slergui) is obviously of this species. It is possibly distinct from *L. marmorata*, Moore, but the bad state of the types that species makes its difficult to decide. I postpone a fuller descri] tion of the genus.

Of this genus another species occurs at Bassein, Burma ; of the smallest and obscurest of Indian batter:!
eems rare in the Malay Peninsula (where,a number of allied forms occur), but it is rather common in South-Eastern Borneo. The genus is also represented in* the Celebes. *Logania andersonii*, Moore, from Mergui, which is probably the *Hypolycet*, of Hcwitson, is

apparently not related to the *Gery*< hough the wretched state of the sole type makes it difficult to say where it does belong. The venation is extraordinary. There are only three subcp^ inches (according to Mr. do Niceville's phraseology two nervu he nervure), the first of which is united with the costal vein for a vet short distance.

98. ALLOTINUS NIVALIB, Druce, (*Paragerydus nivalis*, Diat

Logania substrigosa, Moore).

This species must be placed in *Alhtinus*, the third subcostal bran 2ing emitted immediately before the end of the cell, leaving a mt

distinct upper discocellular vein, as required by Folder's definition of the genus.

'*gosa* be distinct fi-om *nivalis*, my specimens from Me
 M, it be called by that name. But I believe that the tw
 are merely extreme forms of a single species, in which the size and
 mclness of the markings of the underside vary greatly. It is a
 COUnK rom Tavoy to South-Eastern Borneo, and obviously
 Butler, from which, it is indistinguishable
 when flyi:

oTisrus iXKAMaiij Distant.

: «sents tlio Javanese *A. tmlviolaceus*, Felder, f
 Me; i South-Easter^ Borneo. The sexes are much alike. In
 m;
 Tenassorim females the disc of the* hindwing is largely covered
 bluish

In some specimens of *nla* the third subcostal originates
 slightly before the end of the cell, leaving the upper diseocellular very
 distinct, while m others it originates after the end of the eel) and
 there is no upper diseocellular just as in *Paragerydus taras*, It is ah*
 iarkable for the very irregular outline of the wings. This feature
 is lacking in *A Hot in u a m* i Q wl i ich th e subcostal origin ates
 opposite the end of the cell, the upper diseocellular being therefore
 .mi nun

&AOERYDTTS HORSFiBLDir, Moore, (*Allotinus aphocha*, Khoil).

This is the commonest of the from the Chittogong flill
 'racts to South-Eastern Borneo, fonnd in great numbers
 veherever hade. Iain inclined to think that this species fand not i
 apex and margin) is the *Allotinus uni-caming* the types of that
 species it is impossible to dee

The cell in this halfway* between the bases of the se-
 cond and third snbcostals, whicli in the male are approximate. On
 this character the genus *Paragerydus* has been formed, but it is impro-
 bable that it can be retained distinct from *Allotinus*. The following
 species seems to be structurally halfway between tlie two.

1. PABAGEETDUS TARAS, n. sp., Pl. XXIII, Fig. 10.

Ah k brown, deepest apical ly on the fore wing, lacking bo
 -ngato discal brand of the male, and the pale discal area of the
 ?male of *P. ht lit.* Below the ground is creamy whitish (dnll bluish
 Ui, the strire less numerous, especially discally and and
 less evenly distributed ; the apex of the forewing is widely -ufous
 brown, the cilia rather long and also rnfous brown ; rufous brown
 marginal lino; the transverse macular discal band is

* In the female. In some males it is nearer the base of fho second.

nearly as obvious as in *I'* but is composed of t oacent-
shaped markings, beyond which is a sub-marginal lin its,
of which the snbapieal ones on th
area, are touched outwardly with wbito.

In the male the fore wing is longer and more
w, its outer margin but little curved, while in the ! por-
tion is strongly convex. In the hindwing the degree of
lation varies greatly, as is also the case wit Thr
paler than the male and while flying has al most the air of a w
butterfly.

The prehensores obviously differ from those of 7^
the unci (*tegumina*) being rounded and but slightly /bile *iu*
P. h *Ui* they are very oblique and regularly tapering. Aa seen
frcji

the Bide, the clasps {liar- \ two processes separ / a
deep sinas,. the tipper longest, and ending in a strong hook directed
\ipwans. In *P. horsfieldii* fho upper process is obsolescent, represented
only by an angle in the upper contour of the other.

The types are from the Tenasserim Valley, easfc of Tavoy, Burma.
I have also taken it in the Chifcta Hill. ^Tracts. An apparently
identical form occurs in the Malay Peninsnlaand South-En neo,
but I have no specimens now available for comparison.

The venation of this species is interesting. The origin of the
third
subcostal vein is immediately beyond the end of the cell, so that, as in
Paragetyd rsfiddii, there is no upper discocelln
male, the second and third subcostal veins are 'cably :
throughout, and the bifurcation of the latter is n<
cell than the apex of the wing. In this ifc resembles *Allo h.*
102. GERTDUS AKCON, n. sp., Pl. XXIII, Fig. 8.

Male, above, fore wing with the apex and . outer margin black, and
the base (as well as the hindwing) dull fuscous leaving about two-fifths
of its area pure white. A white band extends obliquely 6
one-fourth from the base, widening to the middle median v o-
thirds from the base, where it touches another white are. ig
from the middle median vein to the hind margin ich it c ie
middle two-thirdp, filling likewise nearly two-thirds of the
modian space, and extending, except at its excised lower angle, within
one-eighth of the outer margin, leaving the basal third of the
interno-median space fuscous, aud almost enclosing, with the superior
band, an

i-ea occupying the basal part of the lower median s| and
united with the fuscous basal area. The upper media i s
swollen wliere it crosses the white band, from jnst beyond its origin

one-f
ourth
towar
ds its
termi
natio
n.

Beloi

v
light
rufou
s
brow
n
the

us of the upperside reduced in size aud set in a wide blackish
 are; on the "f obscure dark
 sali »oth v ■ mottli
 of slightlj out shades of pale ! of these between the
 coatal an istal veins are bordered by trans skish lines
 sub sciii extends obliquely across the disc from the
 in.

course the ewelling of ilie upper median

Tin '• is slight! he middle. The lower white
 is much smaller, being narrow and < <*u
 one-third of the hind > . bont u. the
 termiu idrate portion (bi the middle median
 lie middle of (ho interno-median space) being dehiscent oufc-
 :ly ah> e line of the lower median vein. The
 undersid-

id more vr, cd than in the male, with the
 mark-

ings very irregular. Expanse 2| inch I

fwi \a and a femal ^sei- i m Valley, Tavoy district.

wvs CROTON, n. sp., Pl. XXin, Fig. 9.

;irk brown, the apical part of the foi-owing black, an
 jsnt! IOUS whitish extending obliquely from beyond the
 I of the cell to the middle median vein two-thirds from its origin,
 o obsv ish spots beyoud .-uid below it, one on each side of the

§ lower median vein, the lower sometimes obsolete. *Below* very
 dark,

with many shades of brown ; fche band is dull ochreous,
 ■ked, the up tlie two spots is large and but
 sli ie k)v. y small, oblique and
 distinct,

then 1 markings, a subapical cordate spot, and three sub-
 uirginal blackish dots. The) has the If very dark
 wi markings edgi h dark, a blackish
 eeuicircular band witli a slight bluish glos- iding aci*oss the wing
 i the cell, alter which comes a semicircle of joined
 cordate . beyond which the ground is again
 dark, with

I near the apes.

The band is more distinct and nearly
 white,

most to th i and to the middle median vein
 the 11 E the two spots separated from it

lly by the v< ^malltir and more isolated. *Below* much
 lighter aud more % le, the dark sub marginal dots

forming a comp!

awn, except a large sordid area

part of the hind-
round the upper

i. K x i m use over two inches.

>wer angle of the forewing is in this species somewhat less "pro-ii
in *Q. ancon*, the hindwing of the female somewhat

more angled in the mi- median vein of th
male is not swollen. The prehensors differ but
Three mfl 1 a female taken in the Ten
preceding species it has a Btroi
the feeble uncertain motions of the *Parag*
mairy times round the same . or up an
path, and would be difficult to catch but f. in
and again to the same leaf. IOi. GSKYDUS
POISDOVALII, Moore-

a the TeuasBerim Valley, Tavoy district.

105. G-ERTDDs BiGHian, Distar

One *it* im Valley. These four species of <<
lewhat in the length of the cell wh

—*crot*<- In the first, I f th(

i is immediately beyond the origin of the second su
¹ halfway between those of the second and third, as in *I*

Another female (s from the Tenassciim Valley ible

G. ; but the white of the fore wing occupies t!
two-thirds of the cell, just reaching the hind m; ly half the
area *oi* the wiug. The hindwiug is all brown, side- much as iu
biyg

Subfamily

saw what I supposed to be a'luale of this species, near Myi
lying slowly in tho twilight, Having no net with me, i
icies uf *Allotinus* arc t'ten seen flying aim

EXPLANATION OF 1".

- Fig 1 *Everes iimbriel*, n. sp., \$, \
- 2 *Ghlir* i, a. sp., <?,
- 3 31.
- ii 5 . sp., \$, [t. i'-i 1.
- >i G *artegal*, n. -3.
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JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL

Part II.—NATURAL-SCIENCE.

SUPPLEMENT.

No. L—1889.

I.—*Catalogue* Insectfa of tl, No. 1. O
CieindclidflE),—By E. 1 HSOW, B. A.

collections of the 1 L Museum
the old co of the Asiatic Society, and, of
late
!e attention Las been devoted to the su
ons more accessible to the public, and more useful
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fonnd that tin steps to bo taken in tliese directions are the forma-
rrectly named collections, and the publication of catalogues,
only of tL us actually in the Museum, bat of the Oriental
.1 whole. Some progres3 has been made in this
direction,
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>u, the cat; ilogo.es of the Vertebra provide
>t catalogue of tho Moll us en, and of tho sp*
>f tkc animal kingdom found by Dr.

Ai Mr. dt) NiooviHe is bringing to romph-t
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in the i of the Lcpi<loptei*a, and (
with Mr. Cotes, the catalogue of the Heturocerous
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Both these works are con fin <

Ceylon, and a supplemeut will have to be added to the Oriental Region. I have finished the Homop Rhynchota, and the Hercrpteraus portion is passing tb

This, too, deals with the Indian region only, aud v *°> ky g^ing a list of the species found elsewhere in the< I

Mr. Wood-Mason has also, in the press a valuable c *Mantodea*. By the ' 0: Region* is understoo

by Wallace* under that n: it for varioua reasons I h: the course of the river Tangtae, the northern'botmdai

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surface of the Insect Fauna of India has been examined, it m be.said that much that is new remains for workers in this field. I

think

that I am authorised to say that every facility will¹ rded to ndentB and collectors by the staff of otr Indian Mnsimi for n,

their collections, and that it rests with voluntary work collection what it ought to be, tho B world in

I

h the Ori -^iou. The species id« I, and in thi In lluseum, are shown in angular brackets, with the precise local it.,

locality (*Ilab.*) first given is tho one gi books referred to.

References to manuscript and m> have been omitted. In verifying the references, I l rect some errors of omission and commission, for

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consider to be essential for the full study of a j

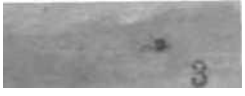
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i Tillerbokanntcn in- nnd ans-Iandisoheu lusokton.'

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3 Coleoptorornm' by Dr. G-emminger and B. do Harold t
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E. T. Atkinson—*Oaiat*

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II.—*Catalogue of the Insecta.*

Order RHVNOUOTA.

Suborder HEMIPTERA- LIOPTEBA.

Family CARSP By E. T.

ATKINSON, B. A.

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Bur., i, 1S79, p. 13.

Mr. Distant in liig ijitroduction* to the of Central America writes:—" The members of this family aro readily recognised by tl elongated and 4-jointed anterinaj, of winch the second joint is frequently more or less tlickncnd at the ape^, and the two **terminal** joints are ra

less slender, and also, and principally, by the corium **terminating** in i\ distinctly differentiated section **called** the cuneus. If wo except a very considerable knov of the Palfearctio **Gapsidite, and a less** acquaintance with those of the Nearctic region, wo may safely presume to *nay* that those of the Ethiopian, Orient I **Australian** regions, are praLi- lly nnworked and unknown." This statement as to our knowledge of the C- is true to the present day as regards the Ethiopian, Oriental, and Australian s. Dr. Stal did much for tl, i], Or. *Herts*, E Argentine Republic, and Mr. Distant has de- md figured a consi •■miml a Central America.

To tudy of the e ' foreopean old world *Gapsidao*, it seemed necessary to catalogue those already described from all countries, and l now present this list to my fellow-entomologists as my contribution No aUempt has ever been made to make a complete ca- talouno L I escribed species, and, indeed, it would have still been impossible to achiev> s it not for the labort ;■, PutoM, Lc ., UIILT. ;: L-rari, ai tt worka aqd author, which must ever remain the principal guides ly.

The btbliograph ble annexed gives the principal abhrevia-

his catalogue and the full title of the works referred to. iptera' and Router's '**Hetaiptera** Gymno-re necessary aids to the student. Fur the

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: , 1883, i>. 2.34.

I **the** older species, reference sb on Id also bo made to Renter's
 'Jl ! :I II -ripter/
aactores -ores^l (Linnaeus, 1758; Latreillo, 1806):
 Helsingfors,

3. In this laborious work, Heir Renter arranges the synonymy on the basis of priority in the printed publication of recognisable descriptions of species, setting aside the compromises due to the 'law of description' or of * continuity of use for a lengthened period/and it is to be hoped that the results of his investigations "will be accepted by all engaged in the study of this order, and that this list, which embodies those results, may be regarded as authoritative in the cases all'cetcL!

reby.

I have not attempted to give references to merely fanciful catalogues, but the table **gives** below indicates the principal local lists in which the family of the *Capsidos* is **noticed**, U<; o Walker's Catalogue of the Hemiptera-Heteroptera

It is carefully understood that these references do not imply acceptance of Walker's synonymical notes, which as a rule are untrustworthy that, perhaps, it would have been better to omit

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Viidali, W. Africa.

Genus CREONTIADES.

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rubrinervia (JH , Sti.!, Stettin, **Ent.** Zeit. f xxul, 1802, p. 321, ?; **Walk.**
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'■:o., Gn: ., San Geronimo, Capetillo.

Genus MINYTUS.

Biol. Centr. Amor. Khyn., 1888, p. 237.

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Hab. Guatemala, Cerro Zunil.

i>i_s,tant, I. c, p. 238. Hab.

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viridia, Donglas & Scott., E> . Mag., iv, 1867, p. 46, t. 1, f. 2 : Walk., Het., vi, p. 51 : Saand. Syn., p. 201: Renter, Rov. Caps. hperbomts, var. d, J. Salilb., Not. Fuuua Fl. Fcnn., 1867,]> Medd. Soc. Fonn., ix, 1883, p. 1; Hab. Britain, Scandinavia, Russia.

Genus CALXIMIRIS.

Reuter, Cops. Amor., 1875, p. "0: Ubler, List, p. 17.

tarsalia, Reuter, I. c. supra, p. 60 : Uhler, List. p. 17. llab. United States, Texas, Wisconsin.

tThleri, Rontor, I. c, p. 60: Uhler, List, p. 17. fiab. N. America.

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3. Guatemala, San Isidro,
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Distant, Biol. Centr. Aracr. Uhyu., 1883, p. 240, 207.

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Hab. Panama, Bngaba.

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Hab. Panama, Volcano de Chiriqni.

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■ j Rev. Syn. Het., p- 284.

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Distant, Biol. **Center**. Amer. Rhyn., p. 285, t. 23, f. 19.

Hab. Mexico.

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Genus BIBACULUS.

Dist. Biol. Contr. Amer., Rhyn., 1884, p. 295.

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Hab. Guatemala, Sonaha, Las Mercedes.

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- bioolor, Fiebor, Wien Ent. Monats., viii, 18C-4, p. 828 : Walk., Oat. Hot., vi, p.
 Beat, Berlin. Ent. Zeits., *xxix*, 1885, p. 159.
sanguinem, Jakowleif, Bnll. Hose, Ivi (4), 1882 p. 359. Hab.
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- bimaoulatua, Jakowleff, Rev. Mons. *d' Ent.*, 1884, p. 122.
 Hab. Persia.
- cingulatus, Fabr., Hant. Ins., 1787, p 307; *id* , Syst. Rhyng., p. 255 : Stal, I ■r.,
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- gothious (*Cihmx*), Linn., Syst. Nat., (ed. 1758, p. 447 : Fabr., En
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- lineolatua, Hrulk', Sxped. Moree, 1832, p. 76, t. 31, f. 6, 7
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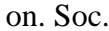
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Hab. All Bturope [Atk., Lille].

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Hab. Tmkiatan.

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Hab. ' .

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r, Ann. ii, 1877, p. 29.

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Erichson, Wiegmann Arch., viii (2), 18i2, p. 280.

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Hab.* Texas, Guatemala, Panama.

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Hab. Guatemala; Panama.

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Ileuter, Pnton Bxplor. Soiont, Tnnia., 1886, p. 17.

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Hub, Tunis, Algeria,

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Hub. S. HiLSBia, Tronscanea;-

gTOfcius, pi., Fieber, Wien Ent. Monats., viii, 1864, p. : *Sk. § Cnt. Utit.*,
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Hub. S. Uussia, Dalmatia.

fulvipes (C'iine»), Soopoli, Ent. Cam., 1763, p. 131: Rout

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Hab. Turkey, Asia *flli*

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p. Hi Rev. Caps., p. 45: Distant, Biol. Ceutr. Amti

Het., vi, p. 71, l

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[*Caloc* i*jr; C

snbg. Horn. ber, Eui 219.

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Hub. Persi

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Witik,,

Eofc., vi, p. 78 : Sannd., Syn., p. 270: **Beater, Bih.**

Vet.-Aka I, p. L3; Berlin, Ent. Zeita., \xix, 1885, p. 46.

%*Kibvlinus*, var *major*, Bohill. Uom. Ilet. SileB., I"

Hub. Nearly all Bnvopo.

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L889.J

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var. *w halm*, Renter, *I. c.*, p. 30.

„ *biplagi* Lenter, Deutsoba Ent. Zeifcs., xxi, 1877, p. 30.

Hab. Hungary, Greece, Turkey, Syria, CanOMUB.

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Vot.-J TlantU., xvi (4), 1878, p. 26 : Walker, Cat. HeL, vi/p. 76; Fiub., Eur. Horn.,
p. 800, Hub. . N. Europe, 8. Siberia.

annulua, Brulle, Expod. MonSe, iii (i), 1882 ; *t&ste*, Puton, Cat., p. 49.

Hab. Greece.

argentinuB (*Phytnchoris*), Berg, ncm, Arg., 1879, p. 122 : *id.*, Add. Emend., 1884, p. 72.

tb. Bneuo^

Beoteri, Fi Zool.-Bofc. Ges. Wieu., xx, 1870, p. 259 : Walk., C
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p. 488; P s), Eur. Hem., p. 26L

Uatxts, GoeKo, Ent. Bcytr., ii, 1778, p. 275.

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iii . 1875, p. 12 ; Rev. Caps., p. 48 (*nee* Costa).

Loltz, Arb, n. Verand. d. SuhlcS-Gos., i, 1846, p. 108.

Hab. Nearly all Europe [*Atk.*, Geneva].

bimaeulatus ((Fabr., Syst. Rliyng., 1803, p. 243 : Stal, Horn. Fabr., *ij* p.
Walk., Cat. Hot., vi, p. 105.

ioa.

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ah. Italy, Dalmiitiu, Greece.

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llab. Hungary, France, Switzerland.
elegans, Renter, Deutsche Eat. Zoits., xsi, 1877, p. 26. tb,
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Ep. 99 : Distant, Biol. Centr. Auier. Rliyn., p. 267 tat, y. I

Hub. Mexico, San Luia

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tultvomaculatns (*Cimex*), Do Geer, Mem., iii, 1773, p. 29
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, p. 255 : Uhler, List, p. 18. ? *limaculatus*,
Una., Syst. >'at. (eti. 10), 1758, p. 44D.
I., Bull. Soo. Ent. Ital, 18K), p. 184: Walk
vi, p. 7 P *femoraUs*, Lncas, Espl. Scient. Alg. iii, 18-19, p.
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Westh., Jakrcsb. Wc^ B. n. KB
SO.
Rol ius), Do Guer, Gen. A Spec, 1783, p. 88 (*nee* Linn.).
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««fi, ., Fauuui. Boioa, 1 »r.),
Eab. Nearly all Europe : Canada [*Atk*^ Li Ho].
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sup., p. **6.** !».

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Greece.

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inz. Ins., i, 1831, p. 202, t. 33, f. 103. P *bipunctatus*,

Buvm., **Handb. Ent.**, ii (ij, 1835, p. 270: Costa, Cim. Regn.

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P *brqpicollit*, Meyer, Rhyii 18-13, p. 47, t. 1, f. 4.

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- lac*, Wolff, lo. Cim., i, 1800, p. (Linn.).
 Hab. Nearly all Europe; Tunis, Turkietao [Atk., Lili -mo, lit
 teyeri, Kolenafci, Mel. Ent. ii, **18-15**, p. 105, t. 11, f, 2(5: Fieb., Eur.
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- l-Ravum (Cimex)*, Goezo, Ent. Beytr., ii, 177S, p. - r. Ryu.
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- nigricepB, J. Sahlberg, K. ll., xvi 25,
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- noTvegicUB (Citnex)*, Giueliii, Syst. Nat., iv, 1788, p. 2170
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- ochromelas (*Gimex*), GmeUn, Syst. N&fc., ^1788, p. **2180**: Rout., Eev. S **He**
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- BE, Io. Cim., iv, 1804, p. 156, t. 15, f. 150: Panzer, Faun. Germ., 94, f. 17: Fallen, Mon. Cim., p. 78 \ *id*, Horn. Baec., p. 84: Zei
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 var. /o, , Wien. Ent. Monats., viii, **1864**, p. 218: Dougl. & Si
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 Hab. Xearly all Europe [*Aik.*, Lille, Hungary].
- opacus; Walker, *Cat. Jlcfc.*, vi, 1873, p. 100: Distant, Biol. *Oen.pt.* Amor.,
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- Palmerii , Hayden Mont. SQTv., 1872, p! 410; Wboeler, Rep. Geogr. Expl. Un.
) 75, p, iJCS. t. 43, f 4; Ball. Un. St. Sarv., ii, lft?6: p. 318; Proo. Boat.
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 Italy, Germany.
- >riniceps, Reutor, Deutscho Ent. *ZcitB.*, 1880, p. 27 ■ Ofrrs. Knata Soo. **F5rh.**,
- Putonh. jioV. d' Ent., Wi, 1S88, p. 180.
 li riu, Cafla.
- Syifc., iv, 1794, p. 172: Fiebor, **Ear.** H
 p. 256: Walker, Cat. **Het.**, vi, p. 74: **Renter**, Bih- Vefc.-Aka.. Eandi., iii -75,
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- dnB (CV lay, Hem. Het. New Harm. Tnd., 1831, p. 20, 4; Uhler, Hayden
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 415; *Vroc.* Bost. Soc. N. H., **xix**, 1878, p. 401; List, p. 18: Walk., -Cat. Het., vi,
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 'or, Herr. Schaffi., Wanz. Ins., viii, 1848, p. 19, t. 254, t 705: Kent. Caps.
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- Reichelii, Fieber, Wei ., i, 1836, p. 103, t. 2, f. 2; Enr. Hem., p. **2S7**: Walk.,
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- juterii, r an. FUz., v, 1882, p. 223 . vtir. in *I. c.*, vii, 1883, p. 29,
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asus, Bronssa.

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 Nearly all Earope _Atk. Dunkirk].

(CopOTta), Meyer,, Renter, Rev. Mcns. d' Ent., i, 1854, p. 213: W
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lineolatus, Costa, Cim. Nfeap. Cent, iii, 1852 {nee Goes
po orna), Renter, Bih. Vet.-Akn
 / M?3. Wien, sxv, I 86.
 Hab. France, Italy, Norio Alps, Hungary, Germany.

rubripes, Jnkowleff, Ball. MOBC , Ii (3), 1876, p. 115. **Hab.** E. Siberia, Ussuri.

rutarinervis [*Capsus*), Horr. ScbiLff., Koraoncl. Ent., i, 1835, p. 49 Ent. Zcits.,
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 ;vitL, Tuuis, Algeria, Syria.

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Hab. N. W, Siberia.

Schmidtii, Fiebor, Weit. Beit., i, 1836, p. 102, t. 2, f. I.

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 196, F. C07 s **Renter. Bih. Vet.-Aka. Handl.**,

- aphli/cf'* . Bull. Soc. Ent. Ital., i, 1869, p. 184: Walk., Cat. Hot.,
yi. p. 75. H France, Italy, Germany, Russia : N.
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- ExJillotii, Paton, Explj Soient. Tnnisic, 1886, p. 19.
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- aemiopacus, i r. Amer. Rhyn., 1883, p. 267, t. 22, f. 9 : I
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- aetiornis (*G-imex* 1775, p. 7, Syst. *Uhynp.*, p.
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Wi I, sp. 54: Flor, Bhyni Irir., >*i*
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- BexguttAtus (*Cim-* L. Ins., 1776, p. 299 : Fallen, Kon. Cim., p. 80 ; *id.*
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- Btigmosus (*Resthenia*), Berg, Hem. Arg, 1879, p. 123 ; Ada. Emend , 1884, p. 72.
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- StoliczkaB.ua, Distant, Scienfc. Kes. 2nd Yarkaud Miss., 1879, p. 10, f. 7:
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- Hab. Spain, Italy.
- superbua, Uhler, Wheeler, Geog. Explor. TTn. St. r, li>75, ji, 838, Proc
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Hab. Arizona, California.
- suturaliB, Jakowleff, Trail; Ent Ross., xiii. 1

- testularis, Paton, Rev. d^J Exit., vii, 1888, p. 864.
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- tenebroaus, Renter, Pet. Noav. Ent., No. 136, 1875, p. 644.
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- ticinensU, Meyer, Rhyn! Schw., 1843, p. 100, t. 6, f. 1: Fieb., **Ear. D**
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- tinotus, Distant, Biol. Centr. Amer. Rhyn., 1883, p. .867, t. 22, f. 8 :
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- triannulatuB, StM, Stettin Ent. Zeit., nx, 1858, p. 183, !;., Cut.
 S9. Hab. Siberia,
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- tricolor, Scott, Trans. Ent. S. Lond., 1880, p. 313. >.
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- trivialis, Coata, Tim. Eegn. Neap. Cent, iii, 1852:
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- icumana, Berg, Hera. Arg. Add. Emend., 1884, p. 72.
 ab. Buena Ayres.
- vandalicus, Itoasi, Faun. Etrns., ii, 1790, p. 2 b., Enr. II. : Will
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nota&us, var. *A.* Blanch., lliat. Ins., 1840, p. 137.
Ab. a., Burm., Handb., ii (i), 1835, p. 270.
F jraxini, Fabr., Ent. Syst., iv, 1794, p. 172; Syst. **RHyng**, p.
8cJ ana. Ins., **iii**, p. 82, t. *DO*, f. 303: Koleuati, Mel ii, p. **113**.
 ofoma, Coata, Cim. Bsgn. Neap. Cent., iii, 1852, p. 3G, t. 7, f. 9.
 var. *hwtmili*, Schummel in Scholtz Prodr. in Axb. id, d. Sciles. G«
 , p. li. Hab. S-
 Euro]i6 C-^^-i Btazzano, Hungary].
- rentralis, Henter, Ofvers. Finska Soc. ForbJ, xsi, 1 32.
 Hab. France, Corsica, Italy, Germany [*Atb.*, Geuoa].
- venustiis, Fiober, Ear. **Hem.**, 18ftl, p. 254: Walker, Oat. Hot., vi, p. 73.
 Hab. Spain.
- vicinua, Horvath, Pet. Nouv, Ent. ii, No. 142, 1876, p. 15 : Renter, Berlin.
 Ent Zeita., xxv, **1881**, p. **176**.
fulvomaculatus, var., Herr. SchnufE.. Wanz. Ins., vi, 1842, p. 35, t).
 llumgary.

Genus CALONDAS.

Biol. Centr. Am* a., 1883, p.

. T. Atkinson—*Calal*<> *the Capsidae.*

iatus, DiBtant, *I.* «., p. 2u8, t. 26, f. 1.

H; ivnia, Bugaba.

superbua, Distant, *I.* c, p. 268, t. 23, f. 22.

Hafo. W Guatemala, Cerro Zani; Panama,

testaceus, Distant, *t. c.* p. 20f), t. 20, f. 2.

Bab. Costa ltica, Irazn.

Genus PACHYPTERKA-

ion. Phyt., 1859, 18; Eur. Horn., ■, 7; Wnlk., f

pa. Amor., p. 13 ; Bih. Vet.-Aka. Handl , iii (ij, 1875, p. 13.

Fieber;

^59, sp. 1; Eur. **Hem.**, p. 2-48.

Hub. Kraiifer Ai

Genus MEGACAEELUM.

■i59, 21 ; Eur. Eora , X861, p. 64% 249: SHI, i . iii,

i. Vet.-Aka. Handl., iii (i), 187i>, p. 14; Rev. Caps.,

|>. . vi, p. 42.

apirJ6, Renter, Ofvers. Fin ska Soo. Forh. xxv, **1884**, p. 30.

Hal Vffrica.

oviiostre, Rent, . Forh., xxi, 18

p. 7.

Hab. Tiirdstan.

elegantulum, J.ikowleff, Hor -ss., six, 1885, p. 124.

.b. Tarkibtan, At-hul Tekk

olongatum, Letliierrv-, Aua. Mus. Civ. Gon., xri, 1881, p. 2D3.

Abyas a.

flliconae (C Cat. Eet., vi, 1873, p. 96; Uhlwr, List, p. 18.

Hab. £. 1

grosaum, Uhler, Eat. Amer., iii, 1887, p. 70: List, p. 18.

Jlab. K. America.

faottontotum (*Phytocoris*), Stal, Ofvera Vet.-Aka. Forh., 1855, p. 36 ; Horn. Af>

1865, p. 18 : Walk., Cat. Hot., vi, p. 11-1. fraria.

infusum (c Herr. Sohiiff., Wanz. Ins., iv, 1839, p. 30, t. l'2O, f, S81 : KE:

um, Ithyn. Wicsb..]» 215, sp. 491 Thornaou, OpHec. Ent., iv, 1871, p. 421:

. Eur. Hem., p. 249: Dougl. & Scott, BHt. Hem., p. 331 P: Walk., Cut.

, i, p. 70: Sannd., Syn., p. 270: Heuter, Eev. Caps., p. 56; *id.*, Berlin. Ent.

Zir 181, p. 11

Ficber, Verh. Zool. Bot. Gee. Wien., xx, 1870, p. 260: Walk., Cat.

Hot., vi, p. 75.

rubidum, Goring],. Bull, Soc. Ent. Ital., i, 1869, p. 185: Walker, Cat. Hot., vi, p.

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Bohcm., Nya SvenBka Hem., 1852, p. 14, sp. 19,

var. *ruficeps*, "Benter, OfverB. **Finska** Boo. FOrh., xxii, 1830, p. 17.

Hab. Middle & S. Europe {*Able.*, **Btassan** **ciaj**.

lustratum, p. B. White, Proc, Zool. S. Lond., 1878, p. 4b'G.

Hab. St. Helena.

Imundum, Uhler, Ent. Am., iii, 1887, p. 71. Hab. N.

America, pelluoens, Pnton, MT. Schw. Ent. Geg., vi,

18S1, p. 125. Hab. Syria, Jaffa.

Ipulchricorne, Heufcer, Ofvers. Pinska Soc. Fiirh., xxii, 1880, p.

18. **Hab.** Spain.

puirillum, Uhler, Ent. Am., in, 1887, p- 71. .

BT. America.

siprnatum, Distant, Biol. Centr. Amer. Ithyn., 1883,

p List, p. IS. Hab. Mexico.

3, Renter, Dootsche Ent. Zeits., xxi, 1877, p. 31.

Hab. Greece.

Genus VOLUMNUS.

ic, iii, 1865, p. 19.

obBCUTicornia (*Gap**, TM), SiU, Of

iii, p. *Mi*: **Walk.**, Cat. Hot., vi, p. 115.

Hab. OafEraria.

straminicolor (*Oap&us*), Stal, Ofvers, K. V.-A., Forh., 1855, p. 36 ; Her p.

19 : **Walk.**, Cat. Het., vi, p. 115. Hab. Caffraria.

Genus MELINNA.

ler, Ent, Am., iii, 1887, p. 68.

fasoiata (*Megacaelnm*), Uhler, Ball. Un. St. Sarv., iii, 1877, . . 1(

(*Atelinnn*) Eut. Am., iii, 1887, p. 68.

Hab. Texas, Missouri.

modesta, Uhler, Ent. Am., iii, 1887, p. 60.

11 fib. N. America.

pumila, Uhler, *L c*, p. 69.

Hab. N.' Ameri.^a.

Genus PROBA.

Distant, Biol. Contr. Amer. Ehyn., 1883, p. 269.

taut, *I c*, p. 260, t. 26, F. 3, var. *b.* ; \. :5.

Guatemala, Cerro Zunil.

Genus PARAPROBA.

Distant, Biol. Centr. Amer. Rhyn., 1883, p. 270.

fasoiata, Dtatw , p. 270, fc. 26, f

Hab. Guatemala, San Geronimo, Corro **ZnnH.** ^ ^

pallesoeus, jv . e., p. 270, t. 26, f. 5.

IT; > (temalfl Znnil.

cms NEOPROBA.

men, Rhyn., 1883, p. 270.

rubescens, D. . c, p. 270, fc. 20, f. C.

lala, Cerro Zuni!

vnrians, Distant, ■ ■; p. 271, fc. 26, f. 7.

Geronimo.

Genus PANDANUS.

p. Auier., Rbyn., 1883, p. 271.

praeclara, Distant, *I. e.*, p. 371, t. 26, f- 8.

San Geroninm

Genus PYCNOPTERNA.

; Gen., 1859, 30; Bur. Hem., p. GG, 262: Rent., Bih. Vet.-Aka.

Sandl. S7S, p. 13, pt. : Walk., Cat. Hot., vi, 1873, p. 70.

amoena, Frovunclier, Fanne Can. Hem., 1887, p. 114.

bla aton, MT. Schw. Bnt. Ges.. W, 1881, p. 124.

b. Syria.

persioa, Router, Pet. Nouv. Ent., ii, no. I JO, 1S76, p. 5.

Hab. Persia, Astrabad.

pulchra, Herr. Schiiff., Wanz. Ins., iii, 1835, p. 7.', t. 97, f. 293: Fieb., Enr.

Hem., . ■; : Walk., Cat. Het, vi, p. 76. many, Frauco.

lata {*Gimex*), Linn., Syst. Nat., (*ed.* 10), 1758, p. 449: Scopoli, Ent. Cam.,

133 : De Geert M^m., iii, p. 290, t. 16, f. 13-15 : Scbrank, Enum. Ins. AHB*T.,

p. 204; ; Fauna Bourn, u, p. 90: Fabr., Syat. Rhyng., p. 255 : Panzer, Faun.

93, f. 22: Wolff, I«. Cim., i, p. 37, t. 4, f. 37, c, *b* : Fallen, Mon. Cim.,

p 78 ; ' ■ • Hem., Saec^, p. 83 : Zett., Faan. Lapp., p. 4S8 : Halm, Wanz. Ing., ii,

p. 131, t- 71, f. 219: Barm., Haudb. Ent., ii (i), p. 207 : Zett., Ins. Lapp., p. 272 ;

Meyor, Rhyn. Schw., p. 94: F. Sahib., Mon. Geoo., p. 97: Kiraohb., Rhyn.

Wiesb., p. 209, sp, 37 : Oosfea, Cim. Regn. Neap., Cent, iii, p. 40: Flor, Bhyn.

Liv., i, p. 490 : Kplenati, Mel. Ent., ii, p. 103^: Fieber (i> a), Enr. Hem.,

-cott, Brit. Hem. p. 320: Walk., Cat. Het., vi, p. 76: Saund.,

Syn., p. 20; Renter, Rev. Caps., p. 65

p, 364,

i) Gmelin, Syet. Nafc., iv, 1788, p. 3183. s, Dvig., Prim.
Fann. lloeq.: 1802, p. 126. Hab. Nearly all Europe
[Atk., Fiume, Hungary].

suturalis, Jakowleff, Bev. Mens. & 'Ent., i, 1883, p. 110.
Caucasus.

Genus PROBOSCIDOCORIS.

Heater, Ofvers. Pinska 3oo. Forh., xxv, 1884, p. 30."

fuliginosus, Renter, *I. c.*, p. 3G.

Hab- Addah, W. Africa.

Genus ODONTOPLATYS.

Fieber, Crit. Gen., 1859, 33; Ear. **Hem.**, 186L(p. 76, 322, -

bidentulus, **Herr.** ScMff., Wanz. Ins., vi, 1842, p. 9G, t. 21

Ear, **Hem.**,

p. **822** : **Walk.**, Cat. Het., vi, p. 143.

Hab. S. Europe [Atk., Wallachia].

Genus EPIMECIS. Renter, Ofvera. Fiuska

Soc. Fiirh., xxi, 1879, p. 30; Zool. **Jfthr.**, 187i», p. 508.

cyllocoroides, Eeuter, *I. c*\, p. 31. i>. 9. Russia, Tauria.

Genus GRYPOCORIS.

Douglas & Scott, Ent. Mon. Mae., vf 1868, p. lit}: Walker, Cat. Het., vi, p. 70.

Fieberi, Douglas & Scott, *I. c. mpm*, p. **117** : **Walk.**, *I. c.* Hab. Syria.

Genus BRACHYOOLEUS.

Fieber, Crit., 1859, 23, t. 6, f. 5; Eur. **Hem.**, p. 56, **250**: Rent., Bib
Handl., iii (i), 1875, p. 15: Walk., Cat. Hot., vi, p. 71.

\ka.,

bimaculatus, Rambur, Fauti. Andal., 18*2, p. 160 : Fieb., Eur. Hera., p. 252:

Walk. **Cat. Ret.**, vi, p. **71**.

PorriB, Ann. Soc. Liuu. Lyon, iv, 1857, p. I

Hab. France, Spain, Italy [Ath., Amieub, France].

lineellUB, Jakowieff, Rev. Mena. d' Eut., 1884, p. U

Hab Persia, **Ordubat**.

aoriptus {*Jygae* br., Syst. Rliyng., 1803,

. iv, p. 182):

rr. Sohaff., Wauz. Ins., iii, p. 76, t. 97, f. 29 I

<), Crit.

or. **Hem.**, p. **251**: Kirsohb., Rhyu. Wi 219, *p. 57, p. 343:

Walk.,

Cat. **Het.**, vi, p. 71: Router, Hev. Syn. **Het.**, p. 200; Fed

, p. 7.

vur. *decolor*, Router, Fedtach. To.rk., 1887, p. 7.

Hab. N. W. Siberia [AlXr.,

sexvittatus, Renter, Deutsche

Ent. Zeits., xxi, 1877, p. 32. Hab. Spain, Italy, Algeria.

Heinii, jReuter, *I. c.* p. 32.

"piuSj Kok'iiatij-Mol. Em., ii, 1845, p. 115 (wee Fabr.). Hab.

Greece, Italy, Hungary, Ruesia.

Germes ONCOGNATHUS.

Fieber, Crifc. Geu. Phyt., 1859, 15; Eoi\ Hem., p. 63, 246: Renter, Rev. Caps, p. 56.

Sti ikowleff, Bull. Moeo., lii (2), 1877, p. 288.

binotatus (*Lygaem*), Fabr., Ent. SyBt., !v, 1794, p. 172; κJ., Syat. Rbyng., p. 235 : Fallen, Mon. Cim.,]>. 75; *id.*, Hem* Snoc, p. 78: Herr. Schaff., Wans. Ins., iii, p. 77, I. i>3, f. 2yS : Meyer, Rhyn. Se; 92 : Oosta, Cim. Regn. Neap., Cent., p. 2G1 -bb., Ehyn. Wiesb., p. 291, sp. 66 t FJor, Rbyn. Lit., i, p. 4t>0 :

ber, Ci-i ?, Eur. Hem., p. 247 : Dougl. & Scott, Brit. Hem.,

p, 3^3: Thomson, Opasc, Ent., iv, p. 422: Walk., Cat. Hei, vi, p. G *id.*, Syii, p. 266 : Jakowleff (*Stenotm*), Bnll. Moso., hi (2), 1877, p. 288, *tf* : Lethi-orry, Ann. Jlus. Civ. Gen., xviii, 1883, p. 749 : lteuter, Rev. Cai>9., p. 55 : Berlin. Ent, *Zehs.*, nix, 1S85, p. 85 ; Rov. Syn. Het., p. 260 : Uhler, List, p. 18. *FaiikuUi*, Trntuai, Syst. Nat., ii, 1806, p. 609.

s, Jabowloff, Bull. Moac, lii (2), 1877, p. 289, *rf*. [ab. All Europe ; Abyssinia, Shoa, N. America [^#fc., Lille, Hungary],

Genus EURYOYRTUS.

Reater, Ofvers. Finska Soc. PSrh., xsi, 1879, p. 33 j Zool. Jahr., 1879, p. 508.

Belle voyoi, Renter, *I. c.*, p. 54. Egypt.

Genus DICHROOSCYTUS.

ieber, Crit. Gen., 1859, g. 36: Ear. Hem., p. 67, 269.

JHt Renter, Bill. Vot.-Aka., Handl., iii (i), 1875, p. 15;

Rer,

Caps., p. 68.

ledius, Renter, C. B. Ent. Belg., 1885, p. slii.

Uab. Germany, Rouniaua,

ruflepeania (*LygaeMt*), Falleu, MOQ. Cim. 1807, p. 81; *id.*, Hem. Snec, p. 92: Zett. IIB. Lapp., p. 274 : fferr. Schaff. (*Cap&us*)', Wauz. Ins., vi, 1842, p. 50, t. 197, f. 010: F. Sahib., C4eoo. Fenn., p. 105; Kirschb., Rhyn. Wiesb., p. 215, sp. 48: Fieber ,, Crit., 1850, 21 ; *id.*, Enr. Hem., p. 270 : Flor, Rhyn. Liv.,

i, p. 489: Doagl. & Scott, Brit. Hem., p. 478 : Walk., Cat. Het., vi, p. 80 : *Sam*. Syn., p. 287 : Thomson, Oposc. Ent., iv, p. 422 : Renter, Rev. Captr., p. 58 ; Rev. Byn. Hot., p. 2 ^

? *apparitor*, VilL, Ent. Auct., 1789, p. 535.

Hab. Nearly all Europe [*Atk.*, Voagea, Franco].

valesianus (Meyer), Fieber, Ear. Hem., 1861, p. 270: Walk., Cut, Het., vi, p. 80.

iiab, France, Germany, Greece, Tunis-

Genus PLESIOCORIS.

fiieber, Ear. Hem., 1861, p. 272: Walk., Cat. Het., vi, p. 81 ; Renter, Bib.
Handl., Hi (i), 1875, p. v. Caps., p. 59.

TyUmotWt 'byt., 1859, 4J ; ;-!., Eur. Horn., p. 68.

rugicollis (*pHyi* Fallen, Hem. Saeo., 182i), p. 79 : Herr. &&&&., Wnna. I
iii, p. 80, t. 98, f. 299: P. Sahib., (Jeoo. Fenn., p. 102: Kirschb., Itbyn. WieBb_M
p. 342, sp. 55a: Flor, Rhyn Liv , i, p. 537 : Thorns., Op, Ent., i V p. 422: Fieber
(*Pleeiocori**), Ear. Horn., p. 272 : Walk., Cat. Het., vi, p. 81: Sannd. Beater, Rev.
Caps., p. r>!J.

Ins. Lapp., 1840, p. 372.

Hab. Scandinavia, Germany, Switzerland.

Genus LYGUS.

tuhn, Wanz. Ins., i, 1831, p. 147: Fieber, Eur. Hem., p. 6&
vi, p. 81: Renter, Kcv. TJaps., p. 61.

Lj< Router, Bib. Vet.-Aka. Hundl., iii (i), 1875, j >. 16;
p. 61.

Orthops, Fiebor, Wien." Ent. M ii, J8"i&, p. 311 ;
Etir.

278: Dougl. & Scott, Brit. Uem., p. 451 : Router, Bii smdl.,
iii (i), p. 18; ;><., p. 73.

adustus, Jatowleff, Ball. Mosa, li (3), 1876, p. 117.

Hal>. Siberia, USH

apicalis, Fieber, Eur. Hem., 1861, ; 'k,, Cat. Het., vi, p. 83.

Meyer Dnr, MT. Schw. Ent. Ges., iii, 1870, p. 207 : Walk., Cat. Het vi, p.

84. Hab. Spain, S. Frmice.

CTbler, Ilaytlen Mont. Bntv., 1872, p. 113 ; Wheeler, Bop. Geogr. Expl
St., V. Zool., 1875, p. 839, t 42, f. 10 j Bull. Un. St. Surv., ii, 187' i; id,
iii, 1877, p. 415; List, p. 18. Hub.

Colorado to Minnesota.

ipproximatus, Stal, Stettin Ent. xix, 1858, p. 185, ? : WaUn

i9 • Uhlor, List, p. 18.

Hab. Sitka.

atomarius (Gajusws), Meyer, Rhyn. Scliw., 1843, p. 73 i. 3: Fiebet

■ >na), Ear. Hern., p. 277, 392: Walk., Cat. Het., vi, p. 82 : Renter, B>

Aka- Handl, iii (i), 1875, p. 16. Hab. Spain, France, Switzerland.

aurantiacus, s_{ne}n. y. Voll., Ent, Tijda., xix, 187G, p. 104.

Hab. Holland.

basicomis (*DeraeocoTis*), Bt&l, Bio. Jan, Hum , i, 1858, |

Llct., vi,

p. 104. Hab. Rio

Janeiro.

iTagii, Router, Caps. Amer., 1875, p. 7l: Uhler, List, p. 1b.

Hub. Now York.

benjralictis, Renter, Enfc. Tidskr., v, 1884, p. 195.

Hab. Bengal.

bicinctus (*Capsua*), Walker, Cat. Het., vi, 1873, p. 100 : Uhler, List, p. 21.

Hab. Mexico, Oaj

Bolivarii, (*lisp.* N. H., 1881, p. 2.

Hab. Spain.

bonariensis (*Qt. Sfcil*, Frog. Eug. Rosa, 1859, p. 25G: Walk., Cut. Bet.,

p. 105; **Berg, Horn. Arg.**, 1879, p. 121 ; *id.*, Add. Emend., 1884, p. 75.

Hab. Bnonos Ayres.

P braohyenemis, Renter, C. K. Ent. JBelg.j 1885, p. xliii.

Hab. Algeria,

ruxmeus, provancher, Nat. Can., iv, 1872, p. 101: Uhler, List, p. 18.

Hub. Canada.

ealigatus (*Deraeocoris*), Stal, Rio. Jan. Hem., i, 1858, p. 50: Walk-. Cat.

HeL, vi, p. 103. Hab. Rit> Janeiro.

cincticoruLj (*Deraeacorie*), Stal, *I. c.*, p. 52: Walk., Cat. Hefc., vi, p. 105.

b. Rio Janeiro.

claTus (*Deraeoc-* : H, *I. c.*, p. 53 : Walk., *I. c.*, p.

105. Hab. Rio Janeiro.

cribratus (*Deraeocorix*), Stal, *I. c.*, p. 60 : Walk., *L c.*, p. 104.

Hab. Bio Janeiro.

jribricolliB (*Demeovorix*), Stal, *I. c.*, p. 48 : Walk., *I. c.*, *p- 103.

Hab. Bio Janeiro.

cribrosus (*Deraeocoris*), St>l, *I. C.*, p 51 : Walk., *I. c.*,]>. 104.

Hab. Rio Janeiro.

campestris (*Cimev*), Linn., Syet. Nat., fed. 10), 1768, p. 448 (**?i8c.** Auct) : Geoffro in

Fourcr., Eut. Par., p. £05 : Rossi, Fatin. Etruec, p. 247 : Fabr., Ent. Syst 171, ?;

id., By st. Ehyng. p. **234** [*nee* Fa lion): **Renter**, Rev. Syn. Het., p. 271.

. Kirschb., Khyn. Wieab., 1855, p. 228, sp. 71, p. 291.

pastir<a.cae, Fallen, Mon. Cim., 1807, p. 86; *id.*, Hem. Suco., p. 94: F. Sahib.,

Gooc. Fenu., p. 113 j **Flor**, Rhyn. Liv., i, p. 523 : Fieb., Enr. Hem., p. 279:

Dongl. & SoQtt, Brifc. Hem., p. 155: Walk., Cat. Hot., vi, p. 85: Sannd.,

Syn.,

rsnlis, Fabr., ^raut. Ins., 1787, p. 304: Keator, Rev. Caps., p. 7o. *L'rsus*,

Thomson, OptiBC. Eut. *iv*, 1871, p. 427. Hab. All Europe [*Atk.* Li!

Carolinae, Renter, Caps. Atuer., 1875, p. 71: Uhlor, List, p.

18. Hab. Carolina, 8. Uuitsd States.

caucasius, Jakowleff, Trudi. Ent. Ross., xii, 1880, p. 12

Hub. Caucasus.

Hrviaus (Cai<iw), ilerr. Bcbafi., Wanz.', Lua., vi, 1842, p. 67, t. 199, L 617 :

Meyer, Rhyn., Schw. 1843, p. 1(S: Kiruchb., Itliyu. Wiesb., p. 222, sp. 60 :

Fieber, Eur.

Hem., p. 279 : Dougl. & Scott, Brio. Hem., p. 454: Sannd., Syn., p. 2771 Walk.,
Cat. Het, vi, p. 86: Renter, Caps. Syn., p. 12; *id.*, Rev. Caps. p. 6

ktcornm, Bohem., Nya Svenska Hem., 1852, p. 67: Flor, Blyn. Liv,
i,

p. 524 (*nee* Thorns.): Walk., Cat. Het., vi, p. 83.

Hab. Scandinavia, Britain, Middle Europe.

cestratus, Berg, Hem. Arg., Add. Emend., 1884, p. 74.

Hab. Uruguay.

CUampionii, Distant, Biol. Centr. Amer. Rhyn., 1884, p. 273.

Hab. Guatemala, Quezaltenango.

cblorionis (*Capsus*), Say; Uhler, LUB, p. 18.

Hab. United States.

ohloriB, Fieber, Crit. Phyt., 1859, sp. 8; Eur. Hem., p. 276 : Walk., Cat. Het. vi.
p.8-1-

Hab. Germany, Hungary, Russia,

conspurcatuu, Router, Bin. Vet.-Aka. Handl., iii (i), 1875, p. IB, : Reut. Ferr.,

Ann. Mus. Civ. Gen., (2 ■.) i, 1884, p. 478, ? .

Hab. Algeria, Biskra.

contaminatus (*phytoconn*), Fallen, Hem. Suec, 1829, p. 97: Zett., Ins. Lapp.,
p. 272 ; F. Sahib., Goo. Fenn., p. 102 ; Fieber (*Lijgus*), Enr. Hem., p. 274 : Walk.,
Cat. Het., vi, p. 83: Saud., Syn., p. 275 ; Rent, CapB. Syn., p. 0; Rev. Caps., p.
65 : Uhler, List, p. 18.

idis, Flor, Rhyn. LM., i, 1860, p. 631, pt. *sulcifrwns*, Douglas & Scott, Brit.
Hem., 1865, p. 459 (*nee* Kirschb., excl.

ayn.). Hab- All Europe, N. America

[*Atk.*, Lille]-

convexicollis, Renter, Caps. Amer., 1875, p. 72 : Uhler, List, p, 18.

Hab. California.

criatata, Distant, Biol. Centr. Amer. Rhyn., 1884, p. 274, t. 23, f. 10: Uhler, Lis
p. 18. Hab. Mexico; Guatemala, San Geronimo ; Panama.

Dahlbomii (*Beraeocoris*), Stal, Rio Jan, Horn., i, 1858, p. 52 : Walk., Cat. Het., vi,
p. 104. Hab. Rio Janeiro.

dilatatus (*Deraeocoria*), St&l, Rio Jan. Hem., i, 1868, p. 52: Walk., Cat. Het.,
vi, p. 104.

Hab. Rio Janeiro.

dialocatus (*Gaptsus*), Say, Hem. Het, New Harm. Iud., 1831, 21, 6 j Uhler,
Prou. Boat. Soc. N. H., iii, 1878, p. 406.

lugubris, Say, MB. ? ; *trifid/H8*, Say Ms. cf,

Hab. E. United States, Canada.

distinguendiifl, Renter, Pet. Nouv. Ent. No. 136, 1875, p. 541.

Hab, E. Siberia.

doraalia, Provancher, Nafc. Cau., iv, 1872, p* 104; Uliioi, 18.

Canada.

1889. *elegantulus*, Jakowleff, Trudi. Eut. Ross, xii, 1880, p.

123. Hub. Caucasus.

fasciatus, Renter, Caps. Amer., 1875, p- 72 : Uhler, List, p. 18.

Hrb. S. Carolina.

fatuus, Lothierry Ju8. Civ. G&n., xviii, 1883, p. "

Hub. ^ ^ K

| iebor, *Em.* Hem., 1861, p. 27*: Reiner, Rev. Caps., p. G2,
Ik., Cat, Hot., vi, p. 84. Hab. Scandinavia, Germany,
Switzerland, France, Italy.

Forelii (Meyer), Fieber, Weit. Beitr., 1831, sp. 9; Ear. Hera., p. 279 : Walker, Cat,
Het., vi, p. 85.

fratrueilis, Berg, Hem. Arg., 1870, p. 289.

Hab. Buunos Ayr

rrautans (*Demeocr-* Jan. Hem., i, 1858, p. 52: Walk., Cat. Het., vi,
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 Chiriqui.
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 <>. Panama, Volcano do Chiriqui.
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Hab. Cos , Iraza.

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Guatemala, Panama.

Genus **CIMATLAN.**

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Hab. Guatemala, Panajaohel.

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Hab. Guatemala, Bullion.

Genus **PAMEltOCORIS**

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Pnton, *Rev. d' Encf.*, vii, 1888, p. 106.

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Hab. Spain, S. Franco, Corsica, Italy, Greece, Algti ;a.

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Hab. S. R .gdo,

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Hab. ¹ . Dorbent.

>.] E. T. Atkinson— *Catttiogw*: [ae.

• ^ **mis SOLEKOXYPHUS-**
.. Bill. Vc(H., iii (i), 1875, p. 38; Hem, Gymn. E
f. 12 ;
Hr. Horn. 18G1 : *M Ieu8*, pt, I
pt, Fiel-
-■pa, Rd I, F- 12 *a*; t. 4, f. *G* ; iii, p. 172, 539.
Wion. Eat. Monata., viii, 186-t, p. 330; Walk., Cat.

Hab. Si S. Kussifi, Sarepia, Turtlsfcan.
> kii-ffiaiew: Sokw. Knfc, Ges., 1864, p. 261: Walk.,
Ca p. 150 : Renter, Horn. Gymn. Enr., ii, p. 258, 305, t- 1, f. 12
d, e
iii, p. 172, 53!). Hab. S. Russia, Sarepta, Astrakhan,
Greece, Cane;
lepidus (Fieberj, Patoii, Ann. Soc. Ent. Fr., (5s.) iv, &74, p. 222, t. 7, f. 3 ; Eeut
a. Gymu. Ear., ii, p ; iii, p. 471, 539.
Hab. S. i¹ >*i*; *i*/*n*. Turan, Mangiahlak [*Atk.*, Snrepta,
Eosaiiii".

Genus MALTHACOSOMA.

Fodfcacb. Trnk., p. 28 ; Horn. Gymn. Ear., ii, 1879, p. 253, t. 1, f. 11
; iii. ■:Jl.
punetip ■., ii, p. 251; iii, p. 539 ; Fedtsoh. Turk., p,
Hub.
Ootina VORTTCHIA. Kentor, *Kern.* Gymn. Eiu\,
ii, 187:' , p. 251, t. 1, L 10; iii, p. 531; Fedtsch. Tark., p. 27-
Rontc) !• 27; rrem, pr« , ii, p. 251 ; Ki, p. 589.
Hab. Turkiatan, "Vom

PLACOOHILU3 .

Jen. Phyt., 1859, 85; *id.*, Ear. Horn. p. 75, 317: Renter, Rev. Caps.
Gymn. EXIT., ii, p. 260, t. I, f. 9; iii, p. 532.
<abg. *PlneochibUy* Beater, Bih. Vot.-Aka., iii (i), 1875, p. 39
p. 1\$6.
■y Gesner, MT. Schw. Ent. Ges., 1861, p. 201: Walk., Cat. ITuf.
ler, Hem. Gymn. Ear., ii, p. 293. isaift, Sarepta.
seladonicua (*iy<jaert&*), Fallen, Mon. Oim.. 1807, p. 77 ; *id.* (*Phytov- aa. Bnee..*
p, 82: (Capsiw) Herr. SchafE, Nomencl. Ent., i. p. 49 : ~\$ir> uyu. Vosb..
p. 211, sp. 103 : Thomson, Opngc. Ent., iv, p. 450 : (*Flacochilus*)
Ea^Hem., p 317: Walk., Cat. Het., vi, p. 141: Renter, Kov.
Caps. Hta^&ymn. Enr., ii, p. 251; iii, p. 470, 539 ; *id.*, Rev. Syi
Exp. Eugl. Ina., 1781, p. 91j t. 26, f. 13.
Hab, Nearly all Europe.

Thunbergii (*Lygaeus*), Fallen, Mon. Cim., 1807, p. 91 j *id.*, (*Phytocoris*), Hem. gne
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Schw., p. 81: F. Sahib., Geoo. Fenu., p 110: Kirac [yn. Wieab., p. !
sp. 106: Flor, Rbyn. Liv., i, p. 608 : (*Fhylus*), Thomson, Opnso. Ent., i
Fieber (*Hoplomaohus*)t Eur. Hem., p. 316: Dongl. & Hem, p. S
X3, f. 1: VViiil: ■ P-^{14(t)} Siumd., s>^m-- P- -ir' : Reuter, Ca] Q.,
24; Rev. Caps., p. 15"> ; Hei a. Gnr., ii, p. 2'SO ; iii,
Tabu, Wans:. Ins., i, 1S31, p. 144, t 22, f. 73.
y all Europe [*Afk.*t Lille j.

Geaus TINICEPHALUS.

Fieber, Grit. Gen- Phyt, 1859, g. (38, t. (*j*, f. 11 ; *id.*, Eur. Hem., p. 73, 299 :
Hem, Gynn. Ear., ii, p. 232, t. 1, f. 4; iii, p. 53'
discrepans, Fiobor, Crit., 1859, Hp. 20; *id.*, Eur. Hem., p. 800: Wall
vi, p. 148 : Kenter. Hem. Gynn. Eur., ii, p. 236, fe. 4, f. 4, <? ; f. Hab. S.
France, Corsica.
fiavopilosus, Renter, Hem. Gynn. Eur., ii, ibSQ, p. 234 ; iii. p. 538.
Hab, Corf
tortulanua (*Capsus*), Meyer^ Rbyn, Schw., p. 77. t. 7, f. 3: (P/. anti
Mel. Kut., ii, p. 125?: Kirschb., Bhyn. Wiesb., p. 249, Bp. L18; r
[em., p. 300 J. Walk., Cat. Het., vi, p. J I^l- ast p. j
iter, Ent, Mon. Mug., xv, 1878, p. 66 ; Hem. Gynn. Km.: ii, p. 236; iii, p
471,
■ -. *TrH**<mi\ n. :JS
f«
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'augl. & Scott., Urit. Ho in., 1Sb'5, p.
lj, Bri< mce, S^vitzorland, Germany, Austria, ? Transcaucasia.
^rubiginosus, Fieber, Eur. Horn., JSfJI, p. 300 : Walk., Cat. 3: Rent.,
Hem. Gyi , u. P- 233, t. 4, f. 3 ; iii, p. 538.
Hab. Spain, N. Italy, Tangiers.
implex, l llnyden Surv. Mont., 1872, p. 417; Bull. Un. St. Surr., ii,
1876,
319 ; M/1B77, p. 418. Hab. Colorado.

Genus MACROOLEUS.

-, Crit. Gen. Phyt., 1S59, 88 \ i<l, Ear. Hem., p 76, 319 Irit.
n., p. 386 : fieuter, Uev. Caps., p. 16i ; Hem. Gynn. Ear., i S, t. 1, f. 3 ;
iii, p. 331.
Amblytylits, pt, Fiebet, Eur. Horn., 186.1, p. 318.

ourantiaouB, Fieber, Crit. Phyfc., 1S59, sp. 38 ; *id.*, Eur. it., Cat.
, Hem, Gynn. Bur., ii, p. 218, 305, t. 1, f.
Hefc Ti(,
8,
? j iii.
Hab uce, Algeria, Greece, Asia. Minor.

152 Capsidae.

^ ["No. 1,

Bolivarii, Renter, Hem. Gymn. Ear., ii, 1SSO, p. 220, t. 1, f. 3d; Ui, p. 537.

Iliib. Spain.

chryaotricbuB, Fieber, Wion. Ent. Monats., viii, 1864, p. 332: Walk., Cat. Het., vi, p.

143 : Renter, Hem. Gymn. Ear, ii, p. 22a, 305, t. 3, f. 6 ; iii, p. 53G. H&b. S.

Russia, Sarepta.

ooagulatua, Uhler, Bull. Un. St. Snrv., iii, 1877, p. 117 ; List, p. 20.

Hab. Colorado.

dissimiUs, Rsuter, Pot, Nouv. Ent., ii, No. 144 111 Horn. Gymn.

p. 227 ; iii, p. 171, 537.

Hab. Italy, Hungary.

exs&nguis fCapaus), Herr. ScMff., Komenc. Ent, i, 1835, p. 21: Kirschnb., Rhyn,

Wie3b., p. 239, ep. 100: Fieber {Mat \, Ear. Hem., t., Cat.

., vi, p. 142 : Renter, Hem. Gymn. Eur., ii, p. 229, fc. 4, f. 1 ; iii, p. l>.

ilab. Germany.

femoralis, Router, Hem. Gymn. Ear., ii, 1860, p. 230 ; iii, p. 537.

Tliib. Aleace.

Krueperii, Renter. 231 ; iii, p. 537.

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longirots- r5s (Amh! ir. Horn., I¹ 319: Wulk., Qfit. Het.,

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i. U ? 5 iii, p. 537.

Hub. Spain, V

Slollae, Renter, V< 1876, p. 5^; Hem. Gynn. Ear., ii,

1870, ;i 224; Hi, p. 471, i>

Hub. Italy.

molliculua [Phyt< len, Hem. Snec, 1829, p. 82 : Her V., W&az 1;

191, f. " iv., p. 78: P.

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LI:

^Thomson, Upaso. Ent., iv, p. %451 : Fieber (X , Eur. Hem., p.

3^1:

DOUR]. & Brit. Horn., p. 887, t. 12, f. 9 , Cat. H

Sauiid., Sya., p. 297 : Renter, Rev. Caps., p. IG] . p.

637.

)Ujfcrim«. N. Uurbutti Soc, iv, 1872, p. 358.

Hab. Nuarly^B ■uro[f, Britain].

naso, Renter, Hal> Cor •TIP , ii, 1H7D, p. 221, t. 1, f. fl 6. o. ; ui, p 471, 537.

ochroleucua jj B), KirsohbaTiM, Rhyn-

Wloab., Reut. Hem!«pSti. Eur., ii, p. 22^ ; iii, p.

47! Hub. <;«rmany, Hungary.

pilo9U3 (Gi fix. Sciurank, Fauna Boica, ii, 1801, p. 87; Reuter, Rev.

iqtevhui, Fiebfu-, Crit., 1«C9, i on., p. 320: Walk., <

. vi, p. 142.

KirsobbauTU, B¹ .., 1S55, p. 2-17, sp. 1H>.

I ; Walk., Cat. Hot., vi,

tanaceti, Fallen, Hem. Suec., 1829, p. 53: Flor, Ehyn. Liv., i, p. 610
Thomson, Opusc. Ent., iv, p. 450: Walk., Oat. Het., *ri*, p. 139. - Sannd.,
Syn., p. 296: Renter, Ent. Mon. Mag., xv, 1878, p. 66 j Hem. Gymn. Eur.,
ii, p. 223, 305, t. 3, f. 7 j iii, p. 471, 636.

Hab. Scandinavia, Livonia, Hungary, Germany, Russia, N. France,
Britain, *iAtk.* Lille].

Signoretii, Reuter, Ann. Soc. Eap. H. N., ix, 1880, p. 194: Hem. Gymn. Bur.,
ii, . 1880, p. 219.

Hab. S. Franco,

P tibialis, Jakowleff, Trtidi Ruseki Eut., xi, 1880, p. 217 : Rent., Hem, Gymn. Ei Hi,
p. 471, 537.

Hab. S. Russia, Sarepta.

Genus ALLOETOMUS

Renter, C. R. Soc. Ent. Belg., 1885, p. xlvii.

vitellinus, Renter, *I. c.*, p. xlvii, fig.

Hab- Portugal.

Genus AMBLYTYLUS.

Fieber, Crit. Gen. Pbyt., 18W, *I* \, f. 22j fñi\ Horn., p, 76, 318; Dougl. &
Scott, Brit. Hem., p. 38S ■;•, Rev. Caps., p. Ittf; *Uom.* Gymn, Eur.,
ii,

p. 208; iii, p. 530.

Ifris, pt,*Halm, Wiinz. Ins., i, 1831: t^ ECirschba
pt., Flor, 1860.

aflinis, Fieber, Wien. Ent. Monata., vni, 1864, p. 332: Dougl. & *Seott*, Brit Hem.,
p. 389: Walk., Cat. Het, vi, p. 56; Saund., Syn., p. 298 Hem. Gymn. I
ii,p.213, t. 3, f. 2 j iii, p. 470, 535. Hab. N. Germany, Belgium,
Franoe, Italy, Britain [*if**., Lille],

albi^ , Habn, Wanz. Ins., ii, 1834, p. 77, t. 5», f. 102: Kiracbb. {*Lnp*
Bly ^sb., p. 195, sp. 9: Thomson {*Phytus*), Opngc. Eut., iv, p. 452 : Fieber
(*Ambbr* Ear. Hem., p. 318: Walk., Cat. Het., vi, p. 55: Renter, Rev. Caps.,
p. 163; *id*,y Hem. Gymn. Eur., ii, p. 209; iii, p. 470, 535.

frontatis, Mulaant & Rey, Ann. Soc. Linn. Lyon, 1852, p. 127.

Hab. S. Sweden, Denmark, Germany, S. France.

vicoUis, Fieber, Crit. Caps., 1859, sp. 35: Eur. Hem., p. 3181 Walk., Cat. Het.,
ri, p. 55: Renter, Hem. Gymn. Eur., ii, p. 2U, t. 3, f. 3; iii, p. 535.

Hab. Corsica, S. France, concolor, Jakowleff, Bull. Moac, 1" (2), 1877, p.

297: Renter, Hem. Cymn. Ear.

ii, p. 214 ; Hi, p- 470, 585. Hab. S. RnaBia,
Astrakhan, Hungary, Tarlnstatt.

delicatuJus, Perrie, Ann. Soc*Linn. Lyon, iv, 1857, p. 167: Renter, Mem. Gymi
Eur., U, P- 210 & P- *69»⁶³⁵; BerL Eut> Z<^its' ttTf 1881> p¹⁶⁰) Hab, S.
Prauoo.

P. Jani, Fieber, Ear. Hem., 1861, p. 319 : 1 r, Hem.
Gynra, Eur., ii, p. 292, t. 3, f. 6,
Hab. Italy.

? longiceps, Flor, BJyn. Liv., i, 1860, p. 554: Walk., Cat, Hc4., vi, p. i 5 : Beater,
Hera. Gyron. Eur., ii, p. 293, t. 3, i. 4. Hab. Livonia.

p. lunula, Fieber, Ear. Ham., 1861, p. 318: Walk., Cat. Het, vi, p. 65: Beuter,
Hem. Gymn. Eur., ii, p. 292, t. 5, f. 9. , Spain.

(Lojnw), Kirschbaum, Rhyn. Wiesb., 1856, p^w, Bp. 10, p. 281 : Flor, Rhyn.
Liv., i, p. 652 : Fieb., Eur. Hein., p. 819 1 Renter Caps., | , Hem.
Gymn. Eur., ii, p. 211, t. 3, F. 1; iii, p. 470, 535.

Hab. S. Sweden, Denmark, Germany, Hungary, Italy, Corfu,

P. oniatnlua, Jakowlfeff, Tradi Eassk. Eut., xii, 1882, p. 140: Beater,
Eur., iii, p. 470. rt^{fl}lj^l
Hab* Caucasus, Derbent.

testftcens, Renter, Hem, Gymn. Eur., ii, 1880, p. 215 j iii, p. 636.
'igary.

Genus MAOKOTYLUS.

^ieber, Crit." Gen. Phyt., 1850, 86; i(i., Eor. Hem., p. 76, 317: Renter, TT^m. Gymn,
Ear., ii, p. 194, t. 1, f. 1 j iii, p. 529,

topm. v^t F- Sahib, aleus, pt, *Roplmaehtfi*, pt,

eber, Eur. HMTI. 18C1: pt. Dongl. & Boott, 3865 :

neruf!> J. Sahib., Notts. SkptB pro Faun. Fl. Fenn., xi, 1871, p. 293;
Renter, Bib. Vet.-Aka, Hatidl., iii (i), 1875, p. -13,

atricapillus (*Litosoma*), Scott, Ent. Mon. Mag., viii, 1872, p. 194; Walk., Cat.
Het., vi, p. 131: Renter, Hem. Gymn. Eur., ii, p. 206 j iii, p. 468, 534.

gradli[^] Puton, Ann. Boo. Ent. Fr., (5 B.) iv, 1874, p. 221,

Hab. S. Franoe, Spain, Corsica, Greece.

attenuate, JakowletE, Trudi Ruaaki., xiii, 1882,] itw, Hem. Gymn I
iii, p. 468, 535.

Hab. S. Russia, Sarepta.

bicolor (*Hacrocoleus*), Fieber, Ear. Hem., 1861, p. 319 : Walk., (; p, 143 .
Renter, Mem, Gymn. Bar., ii, p. 204: fc. 2, f. 6 ; Ui, p. 538.

Hab. Spain.

bipunctatua, Renter, Hem. Gymn. Ear., ii, 1879, p. 207 j iii, p. 535.

Hab. France.

colon, Renter, An. Soo. Esp. N. H., ix, 1880, p. 194 : Ofrrera. Fiuska Soc. Ffirb., xj p,
23 : Hem. Gymn. Enr., iii, p. 467, 534. Hab. Spain,

cruolags (Loptu), F. Sahlberg, Mon. Geoc. Fenn., 1848, p. 89; (AT

Shib Not. Panna Fl. Fenn., xi, p. 294: Renter, Rev. CapB., p. 162 -r Ofvora.

Finska

1889.]

E. T. Afcl

logue

Soc. Forh., xxi, p. 56 j Walk., C: vi, p. 58: Renter, Hem. Gymn. Ear., ii, p. 198; iii, p. 467, 535.

proltxus, Stil, Stettin, Bnt. Zoit., six, 1858, p. 187, \$: Walk., Cat. Het.

Vi, p. 14ri.

Hab. Finland, Karelia, Siberia.

elevafrua, Fieber, Crit. Phyt., 1859, ep. 37 ; Em-. **Hem.**, p. 32J : Walk., Cut. He vi, p. 143: Renter, Hem, Gymn. Eur., ii, p. 199, t. 2, f. 5, ?, iii, p. 535. Hab. S. France, Corsica, Hungary.

fulvicoroiu, Jakowleff, Bull, Mosc, Ivi (4), 1882, p. 364 : Renter, Hem. Gymn. Eur., iii, p. 469, 535. Hab. S. Russia.

Herriohii, Renter, Not. Skpta. Faun. Flor. Fenn., xiv, 1871, p. 24 j Horn. Gymn. Ear., ii, p. 200 ; iii, p. 534,

lilineatus, Herr, Sultiiff., **Wa&z.** Ins., iii, p. 70, t. 96, f. 285 (*nee* Fallen): Kirschb., Rhyn. Wiesb., p. 242, up. 105: Fieber, Ear. Hem., p. 316: Walk., Cat. Het., vi, p. 141. Hab. France, Germany, Austria, Hungary.

Horvathii (*AmblgtyUu*), Renter, Pet. Ntfnv. Ent., ii, No. 144, 1876, p. 21; Hem. Gymn. Enr., ii, p. 203, 305; iii, p. 467, 534. Hab. Hungary, S. France, Greece.

lutescens, Fieber, Yerh. Zool. Bot. Ges. Wion, xs, 1870, p. 262 : Walk., Cat. Het vi, p. 141: Renter, Hem. Gymn. Eur., ii, p. **197**, t. 2, f. 4 j iii, p. 535.

Hab. Spain, Portugal, Italy.

Hfcfc

mundulus (*Leptomvrrjcoris*), St>l, Stettin. Ent. Zoit., *xix*, 1868, p. 188, £ : Walk., Cat. Het", vi, p. 144 t Reuter, Ofvera. Finska Soc, FORh., xxi, p. 56 : Hem. Gymn. Ear., ii, 1879, p. 208, 305, t. 2, f. 7 <T ; iii, p. 534. Hab! E, Siberia, Irkutsk.

nigricornls, Fieber, Wien. Bnt. Monats., vifi, 1864, p. 331, ? : Walk., Cat. Hot., , p. 141: Renter, Hera. Gymn. Enr., ii, p. 196, t. 2, f. 2, 3; iii, p. 535 t Ferrari., Ann. Mns. Civ. Gen., (2 s.), i, 1884, p. 486,

var. *melanocerus*, Putou, Ann. Soc. Ent. Fr., (5 fl.) ix, 1876, p. 282, rf¹. Hab, Greece, Algeria, Tunib.

Paykullii (FJrytocoro), Fallen, Hem. Suec., 1820, p. 106: Fieber (*Macrocoleus*), Eur. Hem., p. 319: Dongl. & Scott, Brit. Hem., -p. 388 : Sannd. Syn., p. 297 : Reuter (*Me*vi* Hem, Gymn. Scan. & Fenn., p. 162: Thomson (*Thylus*), Opuec.

Ent., iv, p. 451: Walk., Cat. Hot., vi, p. 142 : Reuter (*Macrotylm*), Hem. Gymn. Ear., ii, p. 204 j iii, p. 468, 634:

(Poeci(ofio»ia), Curtis.

maeuli,

Herr. Schiiff., Nomencl. Ent., i, 1885, p. 50 : Meyer,

Rhyu.

Schw., p. 81, t. 5, f. 1: Kirschb., Rhyn. Wiesb., p. 241, sp, **104.** var.

mgrtxtes (*Macrocoleits*), Pnton, Ann. Soc, Ent. Fr., (6 e.) iv, **1874**, p. 221. Hab.

S. & Middle Europe to S. Sweden; Tunis [*Atk.*, Dunkirk, Stazzano],

quadrilineatus (Cvm««), Schrank, Verz. Ins. Bercht., 1785, p. 339:

Rent. Gymn. Em*, iii, P- 467. 533; *id.*, Rev. Syn. Het., p. 30i.

Ibopunctatua, Garbig., Bull. Soo. Ent. Ital., i, **1860**, p. 194: Walk., **Cat.** Het.,

*lu>ig*r (itacrotylua)*, Pieber, Crit., ii, 1850, 34; Eur. Hum., p. 818: Walk., Cat. Het., vi, p. 141; Renter, Hem. Gymn. Enr., U, p. 196, t. 2. f- 1. Uab. Austria, S wit norland, Italy. soUtariUB (Cflpsiw), Meyer, Rhyn. Schw., 1843, p. 88, t. 5, f. 4 : Fieb. Eur. Hero., p. 321: Dongl. 4 Scott, Ent. Mon. Mag., iv, 227, t. 2, f. 4 : Walk., Cot. Het. \u 143; Sauna., Syn., p. 297: Rent., Horn. Gymn. Eur., ii, p. 202, 306 ; iu, P-

vur. pilo»U8 (Oncotylus), Douglas & Scott, Brit. Hem., 1865, p. 395 ; Ent. M< Mag., x, p. 166, 277: Walk., Cat. Het., vi, p. 139.

seladonicw, KirBchbaum, Bhyn. Wiesb., 1855, p. 241, sp. 103 (*nee* Fallen* Uab. Austria, Switzerland, France, Britain ZAtk., Bohemia].

DIT. XVII, FLAaiOGNATHABIA, Reufcor, Hem. Gymn. Eur., p. 15 ; iii, 1883, p. 568.

Genus HARPO0ERA

tia, Brit. Ent., xv, 1838, p. 36 i Fiebor, Enr. Hem., p . : Dongl. A Sco Brit. Hem., p. 468: Renter, Rev Caps., p. 16- Efem. Gymn., Enr., i, p. 168 iii, p. 604.

lellenioa, Banter, Pet. Noav. Ent., ii, No. 144, 1876, p. 21; Hem. Gymn. Eur., i, p. 170j iii, p. 466, 528. Hub. Greece.

raoioa (*Lygaeus*), Fallen, Mon. Cim., 1807, p. 81; *id.*, Hem. Suco., p. III: Herr. oyliuff, Nomoncl. Ent., p. 62 : Meyor, Rhyn. Schw., p. 102, t. 6, f. 5, ? : Kirschb., Rhyu. Wiesb., p. 233, sp. 82, p. 277: Pfbor (*Harpocera*), Crit., 28 j *id.*, Eur. He p. 207 s Dongl. & Scott, Brit. Hem , p. 469, t. 15, f. 3 : Thomson, Opnsc. Ent., iv, p. 44S: Walk., Cat. Het., vi, p. 188: Saund., Syn., p. 209: H Kev. Caps , p. 165; *id.*, Hem. Gymn. Enr., i, p. 169, t. 8, f. 6, *f* ; f. 7, t, p. 466, 527; Syn. Het, p. SIS.

antennutUB, Mulsant & Rey, Ann. Soc Lino. Lyon, 1852, p. 129, tf.

Bitrmeisteri (Barpocera)f Curtis, Brit. Ent., xv, 1838, p. 709, f. 709, <f.

ctreuffffhMKi, Costa, Cim. Regn. Neap. Cent., iii, 1862, p. 36, t. 7, f. 6.

curvipes, Meyer, Rhyn. Sohsw., 1843, p 98, t. 5, f. 3, ^.

:/, Stephens, *testc*, Signoret, Bull. Soc. Ent. Fr., 1853, p. liv,

pictkomis, Mulsaut & Rey, Ann. Soc. Linn. Lyoa, 1852, p. 1 I ?

prothyris, Vill., Ent. Auct., 1789, p. 629. Hub. Middle & 8. Europe [iffc, Lille].

Genus BYRSOPTERA.

Spinola, B<fl-, 1837, p. 191 : Dongl. k Scott, Brit. Hem., p. 851 : Rctiu-r, Itev. C* p. 166 i Hem. Gymn. Enr., i, p. 165, 181; iii, p. 501.

Bryocoris, pt, F. Sahib erg, Mon. Geoo. Fenn., 1848.

Captus, pt, Fallen, Mon. Chn.. 1807.

Cylltaorie, pt, Halm, Wans. Ins.

Haitians, pt, Bai-m., Handb. Ent., ii ft), 1885.

Malthacus, Fieber, Crit. Gen. Phyt., 1869, g. 77; Eur. Hem., p. 74, 312.

oylindricollis (*Halticus*)_t Coata, Cim. Regn. Neap., Cent, iii, 1862, p. 280: Horn. Gymn. Enr., iii, p. 465, 627: Horvath, *Rev. d¹ Ent.*, vii, 1888, p. 1S2, d*. Hab. France, Italy, Hungary, Greece.

luscicornis, Reuter, Horn. Gymn. Enr., i, 187S, p. 168j ui, p. 627: Fedtach, Turk., p. 33.

Hab. Turkistan.

pontica, Horvath, *Rev. d' Ent.*, vii, 1888, p. 182.

Hab. Tani'ia.

roasioa. Renter, *Hem. Gymn. Eur.*, i, 1879, p. 167 j Hi, p. 527.

Hab. 3. Russia.

ruffrons (*Capsus*), Fallen, *Mon. Cim.*, 1807, p. 105 : Herr. Schiiff., *Wanz. Ins.*, iii, p. 110, b. 108, f. 338, ? : Burm. (*Halticus*), *Handb. Ent.*, ii (ij, p. 278: Westwood (*Astemma*), *Mod. Class. Ins.*, ii, p. 121: Meyer (*Capm**), *Rhyn. Soh.*, p. 112: Kolonati (*Emycephala*), *Mel. Ent.*, ii, p. 131 : F. Sahib. (*Bryocoris*), *Geoc. Fenn.*, p. 1M : Kirschb., *Rhyn. WieBb.*, p. 235, sp. 77; p. 274: Flor, *Rhyu. Liv.*, i, p. 623: ^ Thomaon, *Opusc. Eut.*, iv, p. 445: Walk., *Cat. Het.*, vi, p. 130: Sanad., *Syn.*, p. 283: Reuter, *Caps. Syn.*, p. 23; *id.*, *Eev. Caps-*, p. 167; *Hem. Gymn. Eur.*, i, p. 166 j iii, p. 4-65, 527 ; *Rev. Syn. Het.*, p. 308.

ambulans, ? , var. &, Fallen, *Hem. Suoc*, 1829, p. 126.

caricis, Fieber, *Crit.*, 1859, 34; *id.* (*Malthacus*), *Ear. Hem.*, p. 313

Fallou): Dongl. & Scott, *Brit. Hem.*, p. 352, 1.11, f. 6.

erythrocephala (*Byrsoptera*), Spinola, *Ess.*, 1837, p. 131. ?

leticocephalits, Scbrank, *Faona Boica*, 1801, p. 78 (*nee* Liuu.J, JSab.

Nearly all Europe, Aaia Miur [*Atk.*] Hungary].

pnton, MT..¹ Schw, *Ent. Gea.*, vi (3), 1881, p. 127; Reuter, *Hem. Gymn. Ear.*, iii, p. 465, 527. Hab. Syria, Kaifta.

Genus BRACHYARTHURUM.

Fieber, *Crit. Gen.*, 1859, 70 ; *Enr. Hem.*, p. 73, 301 : Renter, *Rev. Caps.*, p. 170; Horn, *Gymn. Enr.*, i, p. 164, t. 1, f. 19 d; iii, p. 501.

limitatum, Ficbor, *Enr. Hem.*, 1861, p. 301, ? : Walk., *Cat. Het*, vi, p. U8: **Renter**, *Rev. Caps.*, p. 170 j *id.*, *Hem. Gymn. Eur.*, i, p. 164, t. 8, f. 5, \$ •. iii . 465, 5^

*niyriceps*_t Bohem., *Nya Svenska Hem.*, 1852, p. 67 (*nee* Fallen) ? : Renter, *Caps. Syn.*, 1875, p. 19.

yinetellum, Tbomsou, *Opuse. Ent.*, iv, 1871, p. 244 (*nee* Zett.).

Hab. Sweden, S. Finland, Bohemia.

Genus PHYLUS

aim, *Wanz. Ina.*, i, 1831, p. 26 : Renter, *Bih. Vet.-Aka. Handl.*, iii (i), p. 44, pt j *Rev. Caps.*, p. 168; *id.*, *Hem. Gymn. Eur.*, i, p. 159, t. I, f. 19 fl.c ; iii, p. 501,

Gnostus, Fieber, *Crit. Gen. Phyt.*, 1859, g. 82; *Enr. Hem.*, p. 75.

Teratoacopus, Fieber, *Eur. Hem.*, p. 315.

coryli (Cvm&r), Linn., Syst. Nat., (eel. 10), 1758, p. 451: Fabr., Syat. Ent., 1775, p. 724; *id.*, Syst. Rhyng., p. 234: Schrank, Fauna Boica, ii, p. 84 ?; Fallen, Mon. Cim., p. 88; *id.*, Hem. Suec, p. 90: Herr. Schaff., Nomoncl. Ent., i, p. 62: Burm. Hamlb. Ent., ii (i), p. 268: Westwood, Mod. Class. Ins., ii, p. 132: Meyer, Rhyn. Schw., p. 64: F. Sahib., Geoo. Fenn., p. 99: Kirschb., Rhyn. Wieab., p. 234 sp. 85: Flor, Rhyn. Liv., i, p. 620: Fie her, Crit., 35; *id.*, Eur. Hem., p. 315: Dongl. & Scott, Brit. Hem., p. 356: Thomson, Opuflo. Ent., iv, p. Walk., Cat. Het, vi, p. 88: Saund., Syn., p. 300: Renter, Rev. Caps., p. 168; Hem. Gymn. Eur., i, p. 161 j iii, p. 52fi; *id.*, Rev. Syn. Het., p. 310, 396. ? *jlwvipes*, Scopoli, Ent. Cam., 1763, p. 134.

, Linn., Syet. Nat. («& 10), 1758, p. 449 j Faun. Suec, p. 256. (*Phylus*), Hahn, Wanz. Ins., i, 1831, p. 26, t. 4, f. 16: Costa, Cim. Regn. Neap., Cent., i (1838) p. 60.

? *mfivmtria*, Fallen, Hem. Suec, 1829, p. 100: Puton, Cat., 1886, p. 60. var. *avellanae* (*Gapsus*), Meyer, Stettin. Ent. Zeit., ii, 1841, p. 88; *id.*, Rli Soh., p. 64, t. 2, f. 2 j Herr. Schaff., Wanz. lus., vi, p. 98, t. 212, f. 6701 Kirschb., Rhyn. Wiesb., p. 235, sp. 86, p. 277 j Fiober, Crit., 35 j *id.*, Eur. Hem., p. 316: Dongl. & Scott, Brit. Hem., p. 357; Walk., Cat. Het., vi, p. 88 i Saund., Syn., p. 300: Renter, Hem. Gymn. Eur., i, p. 161, t. 8, f. 2; iii, p. 465, 526. Hab. Nearly all Europo [*Atk.*] Liguria, Hungary].

lituratUB, Fieher, Eur. Hem., 1861, p. 315: Walk., Cat. Hot., vi, p. 87:

Renter, Hem. Gymn. Eur. i, p. 162, t. 8, f. 3 j iii, p. 526. Hab, Ural MoTmtains.

melanocephalus (*Gimex*), Linn., Syut. Nat., {ed. 12), 17G7, p. 728: Halm (*Lygut*), Wanz. Ins., i, p. 155, f. 79: Burm., Handb. Ent., ii (i), p. 268: Meyer, Rhyn. Schw., p. 65: F. Sahib., Geoc. Fenn., p. 99: CoBta, Cim. Regn. Neap., Cent, in, p. 40: Kirschb., Rhyn. Wieab., p. 234 sp. 84: Flor, Rhyn. Liv., i, p. 621: Fie' (*Phylm*), Crit., 1859, 35; *id.*, Bur. Hem., p. 315: Dongl. & Scott, Brit. Hem., p. 355: Stil, Hem. Fabr., i, p. 89 j Thomson, Opusc. Eat., iv, p. 444: Walk., Cat. Het., vi, p. 87: Saund., Syn., p. S00: Router, Rev. Caps., p. 169; *id.*, Hem. Gymn. Eur, i, p. 160 j u, p. 304; iii, p. 626; *id.*, Rev. Syn. Het, p. 309.

diaphanus, Vill., Bat. Auct, 1789, p, 636.

Imcopvs, Gmelin, Syst. Nat. iv, 1788, p. 2167.

nigripes, Muls. & Rey, Ann. Soc Linn. Lyou, 1852, p. 137.

ochropterus, Gmelin, Syst Nat., iv, 1788, p. 2167.

pollens, Fabr., Mant Ins., 1787, p. 306; *id.*, Syst. Rhyng., p. 23-I illo, Hiat Nat., xii, p. 228.

pallidus, Gmelin, Syst. Nat., iv, 1788, p. 2190.

reveatiHn, Fallen, Mon. Cim., 1807, p. 82 j *id.* Hem. Suec, p. 89,

Bab. Nearly all Europe [*Aft.*, Lille].

palliceus, Fieber, Eur. Horn., 1861, p 315; Dougl. & Scott, Brit. Hem., p. USE Walk., Cat. Het, vi, p. 87: Saund., Syn., p, 300: Renter, Hem. **Gymn.** Eur., i, p. 160 j iii, p 464, 62G.

aurantiacus, ToUenhoven, Inl. Hem., in Tijdschr. Ent., xix, p. 104.

Uab. Britain, Holland, France, Spain, Austria [*Atlt.*, Hungary].

plagiatus (Cbpeitt), Here. *BchOB.*, Nomencl. Ent., i, 1635, p. 50; *id.*, Pnnzer, Fan Germ., 136, t. 10, ? : Herr, Schait., Wane. Ins., vi, p. 30, t. 19J, £ 587, d* *i* Fiobe, Crit Phyt., P- 36; ^{ill}-> Enr. Hem., p. 316 : Walk., Cat. Het., vi, p. 140 : Renter, Berlin, Ent. Zeits., xxv, 1881, p. 160, Tar.; *id.*, Hem. Gymn. Eur., i, p. 63,

t. 8. f. 4 j iii, p. 465.

tMfc****, Ftober, Weft. Beytr, i, 1836, p. 104, t. 2, f. 3 Hab. France, Switzerland, Auatria.

Genus ICODEMA.

Renter, Bill. Vet.-Aka, HandL, iii fij, 1875, p. 45 ; Hem, Gymn. Eur., i, p. 167 j iii, p. 501.

Tlagonathus, pt, Fiebor: *Orthotylus*, pt, Frey Gessner.

infusoatum (*piagiognr Jws*), Fieber, Eur. Hem., 1861, p. 803 : Walt., Cat. Hefc., vi, p. 149: Kent., Hem. Gymn. Eur., i, p. 158, t. 8, f. 6; ii, p. 804; iii, p. 464, 826.

pallidta, Meyer, MT, Sohwe. Ent. Gea., iu\ 1870, p. 209; Pnton, i6., p. 421 Walk., Cat. Het., vi, p. 133. Hab.

S. Finland, France, Spain, Auatria,

Genus PLESIODEMA.

Reuter, Bih. Vet.-Aka. Handl., iii (i), 1875, p. 45 j Rev. Caps., p. 171 j Hem. Gymn. Eur., 1, p. 155 ; iii, p. 500.

Agalliastes, pt, Fieber Ear. Hera., 1861, p. 74, 310.

Gap»u8, pt, Zettorstedt.

pinetellum (*Phytocoria*), Zetterstedt, Ins. Lapp., 1840, p. 27C j (*Capstts*) Kirsehbanm, Rhyn. Wiesb., p. 236, sp. 90, p. 277, rf" : Flor, Bhyn. Liv., i, p. 580: Walk., Cat. Het., vi, p. 148: Renter, (*Flesiodema*), Rev. Caps., p. 171 ; Enfc. Mon. Mag., xiii, p. 85 ; Capa. Syn., p. 23 j Hem. Gymn. Eur., i, p. 156, 179 ; ii, p. 804; iii, p. 464, 626 : Saund., Syu., p. 664

lugubrh, Fiebor, Enr. Hem., 1861, p. 312 ; Walk., Cat. Hot, vi, p. 155.

pallidipennin, J. Sahib., Notis Skpta Fanna Fl. Fonn., ix, 1867, p. 178, {

irnpwrum, Reuter, Caps. Syn., 1875, p. 22 («ec Bohem.). ¹ *ipallidipennis*, var.

jS, Router, Hem. Gymn. Eur., i, p. 115. Hab. N. & Middle Europe, N. Italy, Scotland [*Atb*, Lille].

Genus EtTROTAS.

ant, Biol. Oentr. Amer. Rhyn., 1884, p. 302.

nodosuB, Distant, *L c*, p. 803, t 29, f.

12. Hab. Panama, Bngaba.

Genus LAMPETHUSA.

Distant, Biol. Centr. Amer. Rhyn., 1884, p. 303.

anfttlna, Distant, *I. c*, p. 303, t. 29, f. 13.

Hab. Guatemala, Zapote,

Genus PSALLUS.

Fieber, pt, Crit. Gen., 1859, g. 74; *id.*, Eur. Hem., p. 74, 305 r Renter, Bih. Vet.-Ata. Handl., iii (i), p. 47; Rev. Caps., p. 174; *<*, Hem. Gymn. Ear., i, p. 101, t. 1, f. 18; iii, p. 503.

Agalliasles, pfc, Fieber, Bur. Hem., 1861, p. 74, 310.

Apocremnus, Fieber, Grit. Phyt., 1859, g. 73; Ear. Hem., p. 74, 304 >.

Reuter, Bih, *I. c. supra*, p. 47.

Atractotomus, pt, Fieber, Eur. Hem., 1861, p. 71, 294.

Liops, pt, Fieber, Verh. Zool. Bot. *Qee*. Wien, xx, 1880, p. 254, t. 6; Heuter, Bih. *I. c. mipra*, p. 49.

JBlnthii, Scott, Stettin. Ent. Zeit., xxxi, 1860, p. 100 j Walk., Cat. Het., vi, p. 156 : Renter, Hem. Gymn, Eur., i, p. 160; iii, p. 525.

aethiops (*phytocoris*), Zetterstedt, Ins. Lapp., 1840, p. 274 f: Thomson (*Phyf* Opusc. But., iv, p. 446: J. Sahib., Vet.-Aka. Handl., xvi, (4), 1878, Caps. Syn., p. 21; Abo Hem., p. 179; *id.*, Rev. Caps., p. 177; Hem. Gymn. Ear., i, p. 109, 176; iii, p. 617, 519.

intermedium, F. Sahib., Geoc. Fenn., 1848, p. 116 i Renter, Caps. Syn., p. 21; Rev. Caps^ p. 176 j Hem. Gymn. Eur., i, p. 107, 176.

Hab. S. Finland, Lapland, Siberia *ZAlk.*, Finland].

albionotua (*Gapsus*), Kiraohb., Rhyn. Wieab., 1855, p. 256, Bp. 138, p. 332 : Fieber (PaaUtts), Enr. Hem., p. 807; Walk., Cat. Het., vi, p. 152; Renter, Rev. Caps., p. 190 j * &, Hem. Gymn. Ear., i, p. 148, t. 6, f. 3j iii, p. 463, 623.

Hab. Denmark, Germany, S. Austria, Switzerland, N. France, Belgium IV LiUe].

albipes (*Apocremnus*), Jakowleff, Bull. Moac, Hi (2), 1877, p. 298: Renter, Hew. Gymn. Enr., i, p. 114 j iii, p. 520. Hab. S. Russia.

alnicolft, Douglas & Scott, Ent. Mon. Mag., viii, p. 62 : Sannd. Syn., p. 305 : Renter, Rev. Caps., p. 183; Abo Hem., p. 182 } Henu Gymn. Eur., i, p. lft

alni, Douglas A Bcott, Brit. Hem., 1865, p. 414

Hab. Britain, Scandinavia.

ambigwis [*phytoaoria*], Fallen, Hem. Soec, 1829, p. 99 : Zett., Ins. Lapp., p. 27 1 Horr. Sohaff. (*Gapsus*), Wanz. Ins., vi, 1842, p. 43, t. 95, f. 602, g : Meyer, Stettin. Ent. Zeit., ii, 1841, p. 85 P s Rhyn! Schw., p. 60 : F, Sahib., I mn., p. 114: Kiracbb., Rhyn. Wieeb., p. 25*, sp. 132, p. 279: Flor, Rhyn. Thomson, Opusc Ent, iv, p. 846 : Fieber [*Apocremnw*], Bnr. Hem., p. 305, pt; Walk., Cat. Het., vi, p. 150 -. Reuter, Caps. Syn., p. 20, pt; Abo Hem, p. Rev. CapB., p. 178; Hem. Gymn. Eur., i, p. 105, t. 7, f. s; ii, p. 302; iij 517, 519 : Saund., Syn., p. 302.

betuleti, Zcttorstedt, Ius. Lapp., 1810, p. 274.

mutahilis, Fallen, Hem. Saec, 1829, p. 98, ? p. 252, sp. 128.

obscura, Kirsohbaum, Rfayn, Wieab., 1855, *tf*, ? : Douglas 4 Scott, i Hem., p. 406. Hab.

Nearly all Europe.

ncorifer, Pieber, Crit. Phyt, 1859, sp. 24, Vrf., Eap. Horn., p. 304: Walk, Cat. Het., vi, p. 160 : Reuter, Hem. Gymu. Eur., i, p. X04, t. 7, f. 7 ; iii, p. 459, 460, 517, 518.

- wigripss*, Fieber, *Enr. TI.>m.*, 1861. σ
 var. *fuecinervis*, Renter, *Bin. V HandL*, iii (i), 1875, p. 56» c
mn. Ear., i,]> 103, 176, t. 1, f. 18/-A; ii, p. 3n.:S ■ iii,
Bttr., iii, 1883, p. 4/ Ferrari, *Ann. Mas.*
 I6aopo, Greece, Tunis, Aaia Minor [<4Mc.,
 Oatalonfa, Genoa],
antious (*Apr*), Router, *Pet. Nonv. Eut.*, ii, No. 1-i-it, 1870, p. 22;
 Her
 i1S; iii, p. 520.
reyrotricius, Fieber, *Ear. Horn.*, 1961, p. 308: Walk., **Cat. Ilet.**, vi, p. 152 : I
 Bur., i, p. 153 ; iii, p. 5M.
 Hall
atomosus, itejf m. *Gymn. Em-*, i, 187£>? ; ii, p. 303 ; iii, p. -i
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aurora & ll<->3', *Ann. Soo, Linn. Lyon*, 1852, p. 133 : ' . c,
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foetuleti 1S29, p. 97 *Ins., Lapp.*, p. 271
Salilb., Gfooo. p. 114
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 p. 110, 178; ii, p. 302 ; iii I, 519 ; *ROT. Syn. Hot.*, p. : tuul., *Syn.*,
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f a . *Enyn*, 1, **1860**, p. G27, ? : Fieber, Etc
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 ;hyn. *Wiesb.*, 1 ap. 133, p. 327, ?.
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 Cat. 1886.
 ., i, 1835, p. 50, ? .
 Hab -ly all **Eurt** 'inland.
bicolor, Jafcowleff, *Tradi B Eafc.j is*, 1880, p. 219 : Rooter, *Horn. Gymn. Et*
 ia, Sarepta.
bivitreua (*Cap.*^ at & Rey, *Ann. Soc. Linn. Lyon*, 1852, p. UG ; Renter,
 Hem. *Gymn. Enr.*, p. I
 ? = ,a, *Wanz. Ins.*, iit 1835, p. 137.
 Hab. S. Frauce.
earduollus, Horvath, ' Ent., vii, 1888, p. 18
 Hab. Dalmfttia,
 , Renter, Hon.

Hub. B, France.

ehrysopsilus, Heater, *I. c.*, p. 112, 179; iii, p. 518, 8

Hub. N, Hungary.

cognatus, Jakowleff, Bull. Moac, Mi (2), 1877, p. 298 ; , Horn. I
p. 122,179; iu, p. 521. Hal>.

S. Russia, Sarepta.

P eoarerus, Router, Pet. Nouv. Ent., f, 1875, p. 540. *i.*

Corsica.

ooraicus, Puton, **Pet**, Noav. Ent;., i, No. 131, 1875, p. 522: Heater, 11cm,
in, p. 522.

•■ Corsica,

eTioooroijdes, Bcuter, Offers. Finaka Vet. Soc. Forh., xxi, 1879, p 30 <u

Gjnin. Eur., ii, p. 302 ; iii, p. 520.

Hab. S. France.

Crotohii, Scott, Stettin. Ent. Zeit., xxsi, 1860, p. 91 ; Walt., Cat. Hot., vi, p. 153:
Kent., Hera. Gyran. Eur., i, p. 14S; iii, p. 4G1, 525.

Uab. Spt! ■•ance, Corsica.

cruentatus (*Capxus*), Mulpant & Key, **Ann.** Soo. Linn. Lyoo, 1852, p. 131 : Ron
Ilera. Gyrrn. Eur., i, p. 153. >. France.

delic&tus, TThlor, Ent. Amor., iii, 1887, p. 34 ; List, p. 20.

Hab. N. Amer

dilutus (Heyer), Fieber, Crit. Phyt., 1859, ep. 28 ; Knr. **Hem.**, p. 30S : Walk.

Het., vi, p. 152 ; Rent., Hom. Gymn. Ear., i, p. *VdH* ; iii,) Hab. Sivitzerlrmtd.

S diminutus (C Kirsohbauni, llhyn. Wiesb., 1855, p. 25G
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"»5 -. Eeuter, Caps. **Syn.**, |> 21, pt ; Abu Horn., p. lfi
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Scandinavia, Germany, S. Austria, Switzerland, Franco, Britain [*Atk.*,

Lille].

Renter, Hem. Gymn, Enr., iii, 1883, p. 4"

ronewt, Fabr., Syst. Rhyng., 1803, p. 238

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Sahib., Gooe. 1 107: Flor, Ithyn. Liv., i, p. 691 : 'I

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■ **Ecu'**.

Ber. Caps., p. 180.

bor, Eur. Hem., **1861**, p. 307: Dougl. &

Ok., Cat. Hot., vi, p. 152 : lleuter, Uein

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flavo8paT9ua, F. B. W)ute, Rroo. ESooL S. Lond., 1878, p. 468.

Hub. fcJL, Uoltina.

1889.] E. T. Atkinson—*Catalogue of the Capsi.*'

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graminicola (p;,,, , Zettorstcdt, Ins. Lapp., 1840, p. 275 j F, Sahib., an., p. 115 : Thomson, Opuso. Ent., iv, p. 446: Kenter, Caps. 8 !n., p. 180; *id.*, Rev. Caps., p. 179; Hem. Gymn. Ear., i, p. 108, 17G ; iii, . 519.

Hab. Lapland, ! . Finland.

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osus, Beater, Caps. Atner., 1875, p. 89 , List, p. 20.
Hub. Texas.

Senscnxi, Eev. d' Ent., viii, 1888, p. 59.

• Illy

Kirach.bau.mii, Fieber, Enr. Hem., IS61, p. SOS: Walk., Cat.

Het., vi Boater, Hem. Gymn. Eur., i, p. \:

ros&u*; Kirschba-am, Ithyn. Wiesb.j 1855.

ITab. Germany.

), **Plor**, Rbyn. Liv., i, 1860, p. 5S5: Fioli
riiii, 1864, p. 230: **Walk.**, Cat. **Het.**, vi, p. 150 : Router, Abo **Hem** , p. 17
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dehilicornia (Atraetotomus), Renter, Rev. Caps., 1875, p. 1.

Hab. S. Scandinavia, Livonia, H angary, Switzerland,

lapponicus, Renter, **Ofvera** Vo; Pwh., 1874, p. 47; r-v. Caps

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., ULyn. Scliw., 1843, p.

Hab. Lapland, ><d, France, Tyrol,

Hungary.

laricis, Renter, BIh (i), 1875, p. 48 j *id.*, Horn. Gymn, Enr., i,

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roseri, var. *decolor*, Gredlor, NacbJose Wanz. Tyrol, p. 557. **Hab.**

Switzerland, Tyrol, nanfifary [*Atk.* Canton **Yalais**].

laticeps, Renter, i :t-. , i, 1879, p. 180; iii, p. 524,

jidus, Fiobpr, Crit, PI

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ro* -rr. Scblft*, Nomencl. Ent., i, 1835, p. 40 j *id.*, Wanz. Ins.,

96, f. 28V ? j t&., TI,] 19afi . Uhyn.

. p. 268, P .

¹ (*nee* Kirsohb.J. BiiLLiin,

France, Switzerland, Austria, Moldavia, Can-rance].

luridus, Eeuter, Hem. Gymn. Enr., i, 1878, p. 133, t. 1, f. 18 d; ii, p. 303;

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■ Ulese Wana. Tirols, *I. c. supra*.

E.-, mce, Tyrol, **Hungary**,

luteicornis, roillefruy, E3nt. Auct., L789, p. 535; lluuf

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lutosus, F. B. White, Proo. Zool. S. Loud., 1878, p. 468.

Hab. St. Helena.

niollis (*Capsm*), Mulsant & Key, Ann. Soc. Linn. Lyon., 1852, p. 141: Reut., Hem. am. **Ear*** i, p. 139, iii, \ 23.

Hab. 3. FrancOj Corsica, **Gre**

nebulosa, Renter, Hem. Gymn. Ear., i, p. 142, fc. 1, f. 18 I; iii,]

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obscurus (j Fallen, Hem. Succ, 1820, p. 108: Zett., Ins. Lapp., p. - Thomson {*Phy-* i>e. Knt, iv, p. 41G: **Sannd.**, **Syn.**, p. 302: Renter, Abo

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Scott, Brit. Horn., 1805, p. 436 : Fieb., Wie;

., Cat. Hot., vi, p. I

piUjophilus, Flor, Rhyn. **Lir.**, i, 1860j Ilab.

Nearly **all** Europo, Britain [*Atk.*, Lille].

pollidus, Ranter, Ofvers. **PinSfcaTet** Soc. **Forb.**, xxii, 1880, p. 24; id., *Beta*. Gymn. Eur., iii₃ p. 4G2, 523,

piceae,] Hem. Gymn. **Bur** . i. **1879**, p. 135 \

^ Meyer, pt, Ent. Zeii

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]). 09; Herr. ScliulT., Wanz. Ins., vi, p. 25, f. 6

Hab. **Switzerland.**

pinicola, Router, Bih. Yet. Aka. Handl., iii (i), 1S75, p. 51 j W., Hem. Gymu. Ear., i, p. **132, 179; iii**, p. **462, 6**

' *roBi-* Eur. iicm., **1861**, p. 308 (-/; **11J**

Hab. Fr^ **Switzerland**, Hnngar

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i, p. 149: Rent., Hem. Gymn. Eur., I, p. 1

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ptraotulatus (Fiebr), Puton, Ann. Soc. Ent. Fr., (5 s.) iv, 187 7, f.

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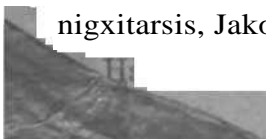
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TABLES

OP

METRIC *WEIGHTS* AND MEASURES

PREPARED FOR THE USE OF

THE PHOTOGRAPHIC AND LITHOGRAPHIC
OFFICES,
SURVEY OF INDIA,

BY

COLONEL J. WATERHOUSE, B.S.C.,
ASSISTANT SURVEYOR

IAp

ASSISTED BY

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SURVEY OF INDIA.

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TABLES

OF

METRIC WEIGHTS AND MEASURES

PREPARED FOR THE USE OF

THE PHOTOGRAPHIC AND LITHOGRAPHIC OFFICES
SURVEY OF INDIA.

Metric Tables.

The metric system* of weights and measures having been adopted in the Photographic Office for convenience in keeping the store accounts, the following tables for the conversion of these measures to British and *vice versa* will be found useful.

They have been based on the relative- equivalents of the metric* and British systems given in Schedule **III** of the Weights and Measures Act of 1878, and have been compiled from De la Rue's Tables and other sources.

As the metric system is now ordinarily used in scientific publications, the scope of the tables has been extended so as to meet, as far as possible, the ordinary requirements of general and scientific reference.

Use of the Tables.

The number required to be converted, whether British or metric, may either be multiplied directly by the decimal fraction representing the equivalent value of one unit of the required denomination, as found in the tables of equivalents or multipliers, according to the accuracy required ; or, it may be broken up into a series of constituent parts in thousands, hundreds, tens, units and fractions, and the equivalents of the several amounts, as found from the tables of multipliers, added together. In the latter case care must be taken to change the position of the decimal point as required for multiples or fractions of the unit.

This will be best illustrated^ examples.

Supposing it be desired to find the equivalent of $645 \frac{1}{5}$ litres in pints,

By the first method $645 \frac{1}{5}$ is multiplied by the equivalent of litre in pints = 176077 , giving a product of 1135961 .
 the second method the total number of litres may be brokei up as follows :—

$$\begin{array}{r}
 600\text{-}00 \text{ litres} = 1056\text{-}462 \text{ pints.} \\
 + 0'00 \quad \text{,,} = 500 \quad \text{,,} \\
 = \\
 6'10 \quad - \quad 0'176 \quad \text{,,} = \cdot \\
 0\text{-}05 \quad 00B8 \quad \text{,,} \\
 \hline
 1135\text{-}9(41)
 \end{array}$$

cwt. :—Supposing it be desired to find the equivalent of 3 ounces in kilogrammes, the whole sum may be reduced **in**

$$5790 \times 502 \times 02835 = 164 \times 161 \text{ kilos.}$$

the result will be more accurately and simply by finding the metric equivalents of the separate items of measure from the tables, and adding them together, thus;—

$$\begin{array}{r}
 3 \text{ cwt} = 152\text{-}407 \text{ kilos,} \\
 20 \text{ lb} = 9'072 \\
 5 \text{ OJ} = 2'268 \\
 10 \text{ OZ.} = 0\text{-}283 \\
 4 \text{ OZ.} = 0'113 \\
 0'5 \text{ oz.} = 0\text{-}014
 \end{array}$$

TOTAL M

the second Th ^, first method wi e the
 simplest and in others I f mUtipi?rS
 S^10W only 3 P^ces of decimals,

taken from the tables of equivalents. T of 3^ least 5 P^ces of decimals should be

NOTE.—The vain*

1" «<1 by Captain Kater in 1818 fle t^M = 37'37<>7tl Inches, in vatut., at Sea-tcvel, 3>>° F. I, has since tiit_n b<n rh^ZA*?PZim* ot' tnc "aix'wct v3rd being «3° F. and 11 remains»o «cognIMd as the authorUative legal equivalent of the metre in >urse Of his camnarl.nn «r *k_ Wtt', f, u^u u^ «*» *«Mltat m3Jc at the Ordnance C; 1 k' f <he true length of the legal

d«eria-h;

Britbh of Length In
 Metric

givro

India

A

mply

Captain Clarke further determined the correct British equivalent of the French metre or the length of the ideal theoretical metre, being the 10-millionth part of the quadrant of the Meridian passing through Paris, to be 39'377196 inches, or, reduced to the same standard of temperature as the legal metre.³⁵ As stated above, in fixing the equivalent of the legal metre, the lengths of the standards were compared at their normal-temperature, viz., 32° for the metre and 60° F. for the standard yard. The Standards Commissioners commented in 1871 that, for commercial purposes, it was desirable that the comparison of the two standards should be made at the same ordinary temperature of the air as 60° F. According to this valuation the length of a brass metre would be 30-330103 Indies.

Table II is based on the determination by Prof. W. H. Miller, in 1844, of the weight of the French *Kilogramm* to be equal to 15432.3484 imperial grains, or 480.7901636 standard avoirdupois grains. Under the Weights and Measures Act of 1878, weight, except for bullion and stones which may be sold by the Troy ounce or by decimal parts of it, and for drugs which may be sold by retail by apothecaries' weight. In the latest editions of the British Pharmacopoeia the only weight used are the grain, avoirdupois ounce (437.5 grains); and pound (7000 grains). Photographic and chemical articles which may be sold by the Troy ounce or by decimal parts of it, are commonly prepared according to Apothecaries or Troy grains, drachms and ounces, but the use of Avoirdupois and Metric Weights for this purpose is fast extending.

The tables have been carefully revised in the Trigonometrical Branch office by Mr. W. H. Cole, M.A., Deputy Superintendent of "Survey,

I.—Measures

Metric to

The fundamental unit of Metric Length and Weight is the METRE, assumed to be the to-standard metre at normal temperature of 32° F, t\$ 39 37°79

| | Unit | Incnea, | Feet. | Yardfl. |
|-------------|--------|---------------|--------|-------------|
| Millimetre | 1/1000 | 003937 | 0003*8 | 0'Ooiog |
| Centimetre | 1/100 | 0' 39171 | 00 | 0'OIO'M |
| Decimetre | 1/10 | | 0-j | |
| Metre | unit | | | |
| Decametre | 10 | 393'7°(90 | | |
| Hectometre | 100 | 3,917*07u00 | | 10,93033050 |
| Kilometre | 1000 | 3P,3,70'75Or; | | |
| Myria metre | 10000 | 93.707*0000 | | |

One Mitron (fX.)ti'. miira) * one thousandth of a millimetre = .001 millimetre = '000039 TM

M*LTl

| | Metres. | Millimetres to Incheu. | Feet. | Motroa. | Centimetres to Inches. | Feet. |
|----|---------|------------------------|----------|---------|------------------------|--------|
| 3 | 0'001 | 0' 0 37 | 0-00338 | 0'0i | 0-3037 | 00338. |
| | 0'002 | 0*07874 | 00050 | 0'0i | 0-7874 | 00058 |
| | 0*003 | 0' 118u | 0*00 184 | 003 | 11811 | 0 164° |
| 3 | 0*004 | 0-15748 | 0-01311 | 004 | J-S718 | 8 |
| 4 | 0*005 | 0-19085 | 0*01640 | | 8 | 0*19* |
| 5 | 0'00S | | | 00S | | 0 |
| | 0*007 | | 0 01JQ75 | 007 | | 0-w07 |
| 6 | 0'00S | 0-31457 | 9i3 | 00S | 3*1497 | 0ao-15 |
| 7 | 0-00 | | 0-031-J1 | 0'oQ | 3 5434 | |
| 9 | 9 | 0'333/t | | 0'10 | | |
| to | 0'oio | | | | | |

British

| | Millimetres, | Centimetres. |
|-----------------|--------------|--------------|
| 11 inches | 280-000 | 01*4 3 |
| 3 feet | 914-400 | 183-87670 |
| 3 | | |
| 5* | | |
| 40' | | |
| 8 Tt) Honge | | |
| 1 inch | 25.4 | 101.6 |
| 1 foot | 304.8 | 1270 |
| 1 yard | 914.4 | 3600 |
| 1 fathom | 1828.8 | 7200 |
| 1 pole or perch | 5029.2 | 12500 |
| 1 furlong | 20116.8 | 40800 |
| 1 mile | 160934.4 | 321840 |

1 chain = 20.1168 Metres. 1 Geographical mile = 1814.37 Statute miles = 3218.48 metres. 1 degree
1 mil = 1/63360 inch = 0.0254 m.i

| | Millimetres. | Inches to Centinattroa. | Deoimtras. | Oentimetres. | Feet to DeoimtrB. | Metres. |
|----|--------------|-------------------------|------------|--------------|-------------------|---------|
| 1 | 35'3»5 | a'S4 | O»S4 | 30-475 | 3*048 | 0-305 |
| 3 | 50 7 | 5-08 | O'\$08 | CO'057 | Oog6 | 0610 |
| 3 | 70'lg8<5 | 7S2 | 0-763 | 01*438 | 9T44 | 0-914 |
| 4 | 101 | io-rfl | roid | 153-397 | 13'1£3 | 1*319 |
| 5 | 136-9977 | u'70 | 1-370 | 181*875 | 15-240 | |
| 0 | 1S3'3073 | 1534 | I'534 | | | |
| Z | 177'7?48 | 1778 | I 778 | | 18*183 | |
| 8 | 303*19<i3 | ao'33 | 3*031 | | 31-33S | a-134 |
| 9 | aiS'sgiO | arce | raid | | 34-384 | 8*438 |
| 10 | 353*9954 | 35"40 | 3*540 | 374-315 | 37'433 | 3*743 |
| | | | | 304704 | 30-470 | 304S |

1 inch = 25.4 millimetres. 1 inch = 2.54 centimetres. 1 inch = 25.4 millimetres.

Fractions of an Inch to Millimetres.

J3 ■
3*0*85 -
3*1749
8

t
A

0*8487
A = ft
0-5080

.ength.

British.

millionth part of the quarter of the earth's meridian The legal British equivalent of inches, of the British the the British standardyard at the temperature of 62°F.

| | | | | | |
|-----------|---------------------|------------------|-------------------------|-----|--------------------|
| Furlonga. | Miles,
Furlongs, | Miles,
Yards, | | | Inoho9,
about A |
| 000005 | | *= « | | o | n J |
| 0000jo | | = o o o o | | o | 3,r |
| COO497f | OOqOfiJ | = o | | o | n |
| | | = o | | 3 | u |
| | 0-02139 8 | = o o o | | 1 | ti |
| 49'7"59 | ntm (jJftl.) = | = o | one-miJllonth of a | 10 | > |
| One micro | millimetre or about | = 6 | 0-00000004 of an I nth. | 109 | |

PLIERS.

| | | | | | | |
|---------|-----------------------|---------|-------------|----------------------------|--------|------|
| Inches. | Metros
to
Foot. | Yards, | Feet- | Kilometres
to
Yards, | Miles* | |
| 30'37» | 3a8i | | e , 5 j 9 | / 9 3 3 | o-Oii | 1 |
| 743 | 6*563 | 7 | 0,843-697 | 2,187-366 | 1-24J | a 3 |
| 11B11 | | 3*381 | *(3,*33'5y7 | | | 4 S |
| i57"483 | 13 i34 | 4*375 S | 16,404-496 | | | e |
| '90-854 | | | | | | 7 . |
| 3 \$ | 10-685 | 75 | 19,685*395 | 7,65S'431 | 4*350 | S |
| 37550S | | 8749 | | 5 | 4'97* | 9 ia |
| 3M 9*^ | 3Of5 | 5-8^3 | | ,7 | 5*593 | |
| 3S4*337 | 33809 | | | 9,8+J 637 | | |
| | | | | 10,930'33» | | |

Metric.

| | | | |
|------------------------------------|--------------------------------------|---------------------------------|-------------|
| Daoimtras. | Hectometres. | Metros. | Kilometres, |
| 0'JS400 | 0*00015 000305 | | 0*00003 |
| 3 ? g | 00014 001819 | \J479 0-05029 | 000030 |
| 9" U383 | 3,01 r<54 306 | 0*91438 16,093149^*. | oooogl |
| 1^38767 | | 1-81877 | 000183 |
| U*303 kitometrea. | The length | 5'oagn of 1' of latitude at 45° | |
| "= 6,076 f«t « 1-1508 Statute mil* | K>i-UJ<37 i Une = A Inch = 3'n56 mm. | | |

= 1832 metres, nearly.

PLIERS.

| | | | | | | |
|-------------|---------------|-------------|-------------|------------|-------------|----|
| Decimetres. | to
Metres. | Kilometres, | Metres, | KIIM
to | Kilometres. | |
| g | 0*914 | | i.soj^ts | i(i'Oi)3 | i"609 | 1 |
| 18M877 | | 0001S | 3,118'630 | 33" 186 | 3 3 19 | 1 |
| 37 43'5 | a'743 | 00037 | 4,837945 | 48-379 | 43*8 | 3 |
| 3(5-5753 | 3-653 | 00037 | eH373™ | 64'373 | a-437 | 4 |
| | | 0*0048 | 8,040*575 | 80-466 | 8047 | 5 |
| 54*8630 | 54 | 0*0055 | 0,(555*8^ | 05-559 | 9-636 | a |
| 64-0068 | G'401 | 0*0064 | 11,365-304 | 111*058 | Ifffs | I |
| 73-SO7 | 7'3'S | 00073 | ia,874S1o | "8745 | 13-87S | |
| 8 9 4 5 | 8'339 9* | o'ooSa | U.483'834 | 144 838 | ■4'484 | 9 |
| O14383 | 144 | 0*0091 | 10,093' M 9 | 160'»JI | IS'393 | 10 |

Approximate Values.

| | | | |
|------------------------------|---------------------------------|--------|-------------------------------|
| t kilometre | w about s furlongs ["019 less) | t mile | riy 1* kilometre (l°o -----,- |
| = „ ~<Jl Uichca (-oag" leas) | | 1 yard | metre. 11 Metres = i; yards, |
| | | 1 foot | = „ 30J centimetres. |
| | | = | = M A |
| 1 it-1 | | m | „ 15} millimetre* |

Tip convert metres to yards add h-
 .Decimetre . = i 1"^^* ^VI tMClty)
 I Centimetre . = Jnwh
 i Millimetre

973 TJ44 1*555

1-866

3177

2<S8a'799 3*uo

A =

1*30
0-65

0*187
o'aiS
0a49
0380
0*31*

The unit of Metric Measurement is the STERE, or CUBIC METRE, -weighing Metric to

| | | | |
|-----------------------|---|--------------------|--------------|
| | * | | Cubio Metre. |
| ibic Millimetre Cubic | = | 1,000 Cubic mtlim. | = 0 0000001 |
| Centimetre Millet ere | = | 1,000 „ ceutlm. | = 0*0001 |
| (cubic dccitn.) | = | 10 „ ilL-cim, | ss 0'001 |
| Centiatere Decitttere | = | 100 „ „ | 9 0'O(|
| STERI (cnbic metre) | = | 100 „ „ | m 0*1 |
| Decastere | = | 100 „ „ | = 1 |
| Hixtoatete | = | 100 „ „ | <= 10 |
| | | | 1C 100 |

NoTK.-The Sterc is more generally used for measuring timber, wood-work, or

MULTI

| | | | | |
|---|------------------------|---------------|------------------|-------------|
| | Cubio to Cubio Inches. | Cubio Inoles. | Cubic Decimetres | Cubio Feat. |
| | 0061 | 01-037 | | 0-035 |
| | 01H | 12 a'054 | | 0071 |
| 3 | 0183 | 183-081 | | ■ o'tod |
| 4 | 0*144 | :M4'lo3 | | 0141 |
| | 0*105 | 30SMJS | | 0177 |
| 5 | 0*386 | | | |
| 6 | | | 3<K 163 | 0 an |
| 1 | 0*488 | | 437-180 | 0-283 |
| Q | 0*549 | | 488*3 iS | ' 0,3*8 |
| | O'oio 010*171 | | | 0.3S3 |

British to

| | | | |
|------------|------------------------------------|---------------------|---------------|
| Cubic Inch | Cubio InoheH. Cubic Feet. | 00005787 1 00 37*00 | Cubio Yards, |
| Cubic foot | | | 0:000002143 |
| Cubic yard | Cubic Inches to Cubio Pngtimotres. | 16'30 | 003704 1'00 |
| | | Cubio Decimetres. | MUL |
| | | 50-631 | |
| t | 49-159 | | Cubio Metres, |
| 2 3 | | | o'M8 0-057 |
| 4 5 | | MI-S77 | 0085 |
| | o8-3'7 | | 0*141 |
| 7 8 | | 158*307 | 0*170 |
| 9 10 | 131*089 | | 0*198 |
| | | aSj'153 | |
| | | | O*a8, |

Approximate

1 cubic metre is nearly 1 1/3 cubic yard (1 1/3 % less). 1 „ ia netirly 35J cubic feet (05 7o less). to cubic metres equal 13 cubic yards. 1 cubic yard is about f cubic mAre (1 % more). 1 cubic foot is about 314 cubic decimetres (<'oi3 less).

NOT 1,—To reduce cobk metres to cubic decimetres or cubic centimetres, which are all multiples of i.ooo, the decimal to convert cubic metres into tubi* decatnetrea or cubic hectometres the decimal point is removed 3 place* tit * time to the

[asures.

'niiier, or t.ooo Kilogramme*, of pure **r, at f C. (39'?

British, *>■

Cubio Yarda.

Inohoa. o'0000003
o'0000Si 0000353
0-0C10J7 0035317

o'0000ot
o'001^08
0-013080
o' 13080a

6102705
61027051
610270515
.....

o'353160
3S3i6i8
35-3i658i
353165807

13-080315
130-801151

volume.

The Centistere, Decistere,
PLIERS.

Hectoster
e 353I-65807* arc
not cubit mtas

Onbio Metres

1

to

Cubio Feet, Cubic Yards., 1*308 a'fi-6 '9*4

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3

105950

4

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S

176.583

7848

6

an 899 347-316

9156

7

381-533 10464

8

17-Sj!) 1177J

9

353'>^M 13-080

10

Cnbio Geatimetres.

Cnbio Deoimetrea.

Cubic Metres.

0-016386

0*000016

38'3i53'a

0018315

0-764513

PLIERS.

Cubio Yarde
to

Cubic Metres.

•Cul>ic Decimetres.

■ 0-765

1

764-513

i"5'9

a 3

a-304

4 5

3058*0:4

3058 3-8i3

4587

4587-080

535*

5351-554

6-lift

9

6116-107

*,

10

7645*134

6-861

aj>>tjJJ
, cubic ^ w
, c«bic j

h>ch Uj

inches cubk inches ic«). 5 inch
(^00197 cubic inches leas)- J inch
, Oco^ cub.c .^ k»).

.—Square

The Unit of Metric Measurement Measure

Metric to for Land

Hiare Millimetre Square
Centimetre Square Decimetre
Square Metre, or Centiare
ARKHectare

TBeSrreg Sq. Metre.

Sq. centim. , tleclm.

Inches

Feet,
0-00001
o'ooioS
cr 10764

too
10,000

J5*500S9
Square Decimetres

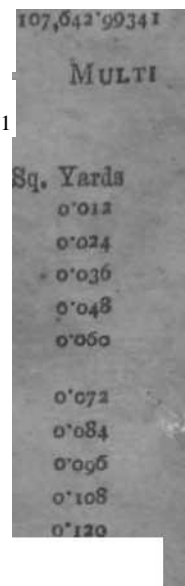
1,0764:053

Square Milling.
to Sq,
Inche3.
0'0Q3
0*003
0005
0006

Sq. Metres.

Sq. Inches.

to
Sq.
Feet.
0*108
0*315
31001



0*008
7
0'oop 0*o 11 (1*013
8 0*014
9 0*016

:i, Inches.

entimetrea to
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o'Ooi

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134'oo5 »39*505 0*96
155'ooft 9

Square Millimetres.

•Squa
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Foot
Yard
Perch
Rood
Acre
Square Mile

0*004
o'Sio 0-775 0-005
0*030 i\>83 o'ooft
1-340 1*395 1-550 0*ooS
o\O9
0*010
o'on

inches.

■ 9 ■
»30-35 „ yards.
- .40 ..
'■ 4 roods.
TM 640 acres.

Britis
h Square
Centimetres.

6-45137
028-99683
8,360-37150

Square Inches to
Sq, Mifl''''''! Sq.
CeutiiLS.

8 9
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MULT!
Square Yarda
to

| Sq. Deoiins. | Sq. Metres, |
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| 167-319 | 1-6713 |
| 350*819 | |
| 334-439 | 33444 |
| 418-049 | 41805 |
| 501*658 | 5*0166 |
| 585*368 | |
| 66S-878 | 0*6888 |
| 75a''487 | |
| 836097 | 83610 |

5806*130
•J4S1.3<7

square of ^ of an Inch,
f-L of an

Approximate

or

| | | | |
|-------------------------------------|-----------|---------|-------|
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| 25*805 | 3,715,987 | a | |
| | 4,644,084 | 46*4498 | o |
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| | | | 0-279 |
| | F | | 0-372 |
| | e | | 0*434 |
| 33-708 45'160 51*611 . 58063 64*5*4 | | | o'557 |

One square millimeters is ^t 7,431,975 nearly [^] of a Square Inch, or
 the One Square centimetre is* nearly ¹¹⁹⁷ -L_ of a 1
 One square metre contains rather more
 One are is about [^] of an acre
 One hectare contains nearly if acres.

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0-173 |
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8-373 86'IU
9'SSS 96*870
io-7<34 107*643 | 5*980
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inch contains about 5Js ; millimetres or 6\ square :cntimetre».
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 One ya^'J '«''«''^ * or W J <3«^e
 metre, ?£« *n Jrty 4ol arcs or } of a hectare.
 S^Tare miN is very nearly 359 hectare.

VI.—Conversion of British



British

The unit of British Indian Weight

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of Bengal

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Approximate Equivalents,"

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Indian and Metric Weights.

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Milligrammes*

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I = 7775''874
I = 8747 858

Useful Data.

- 1-215 Tolas.
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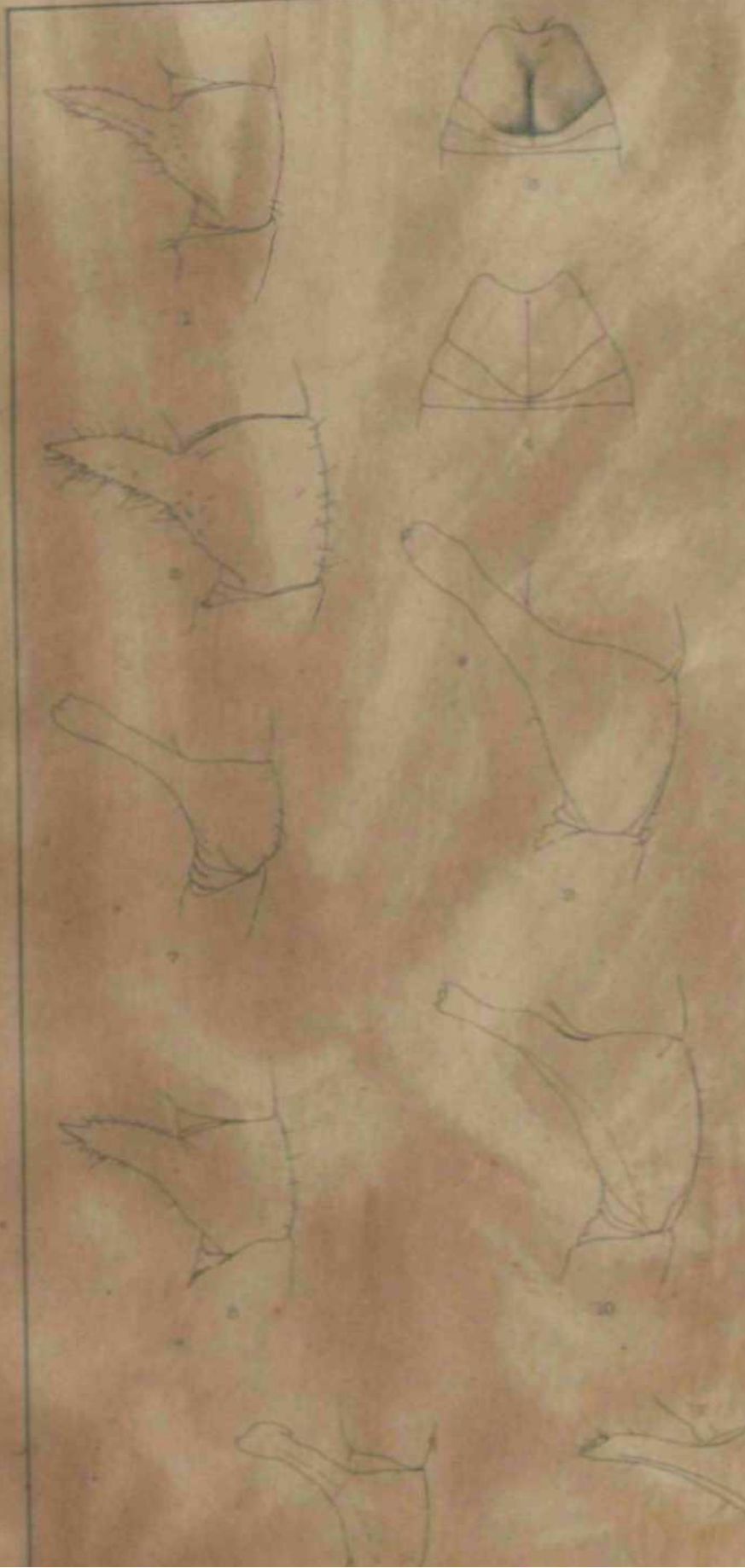
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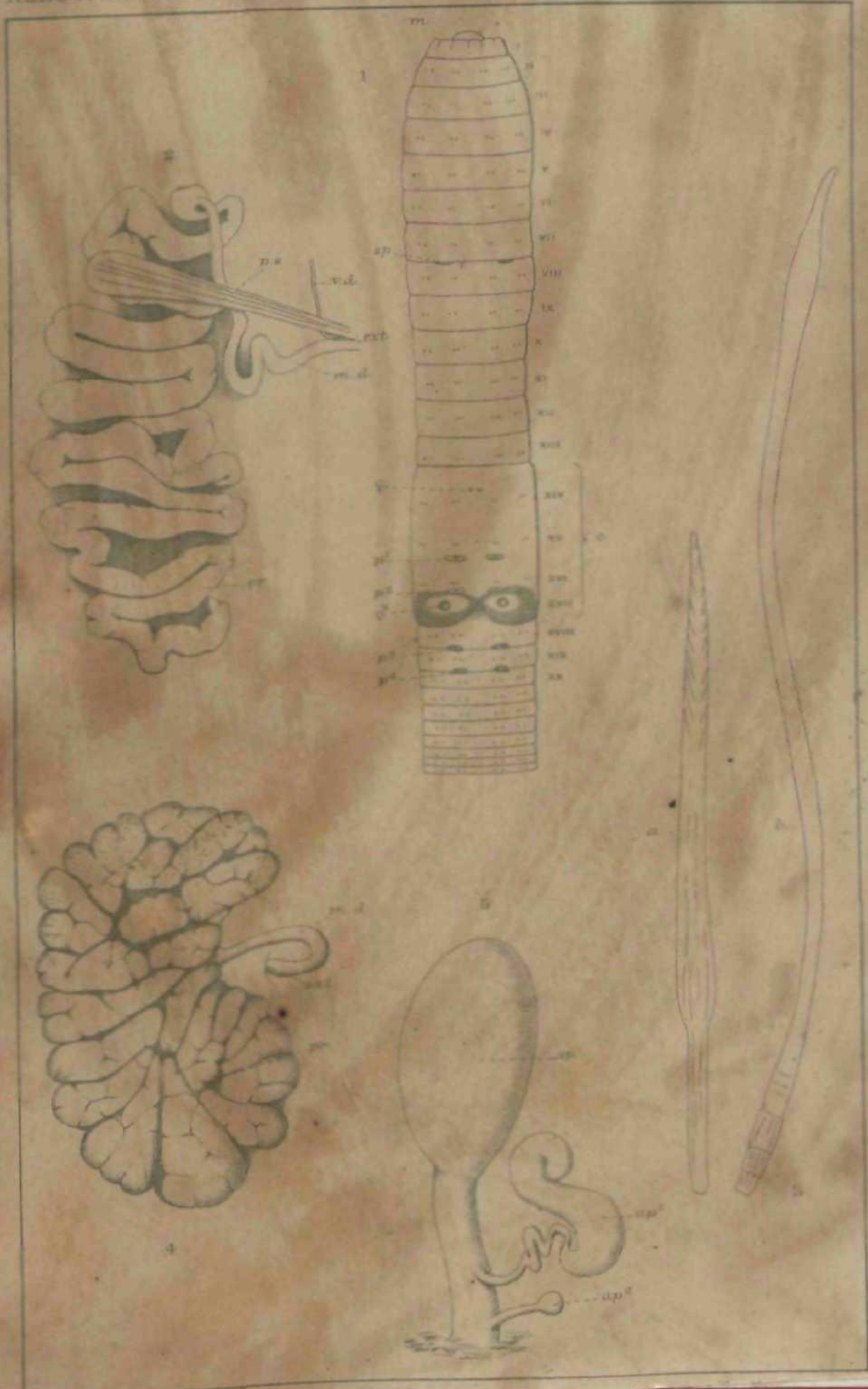


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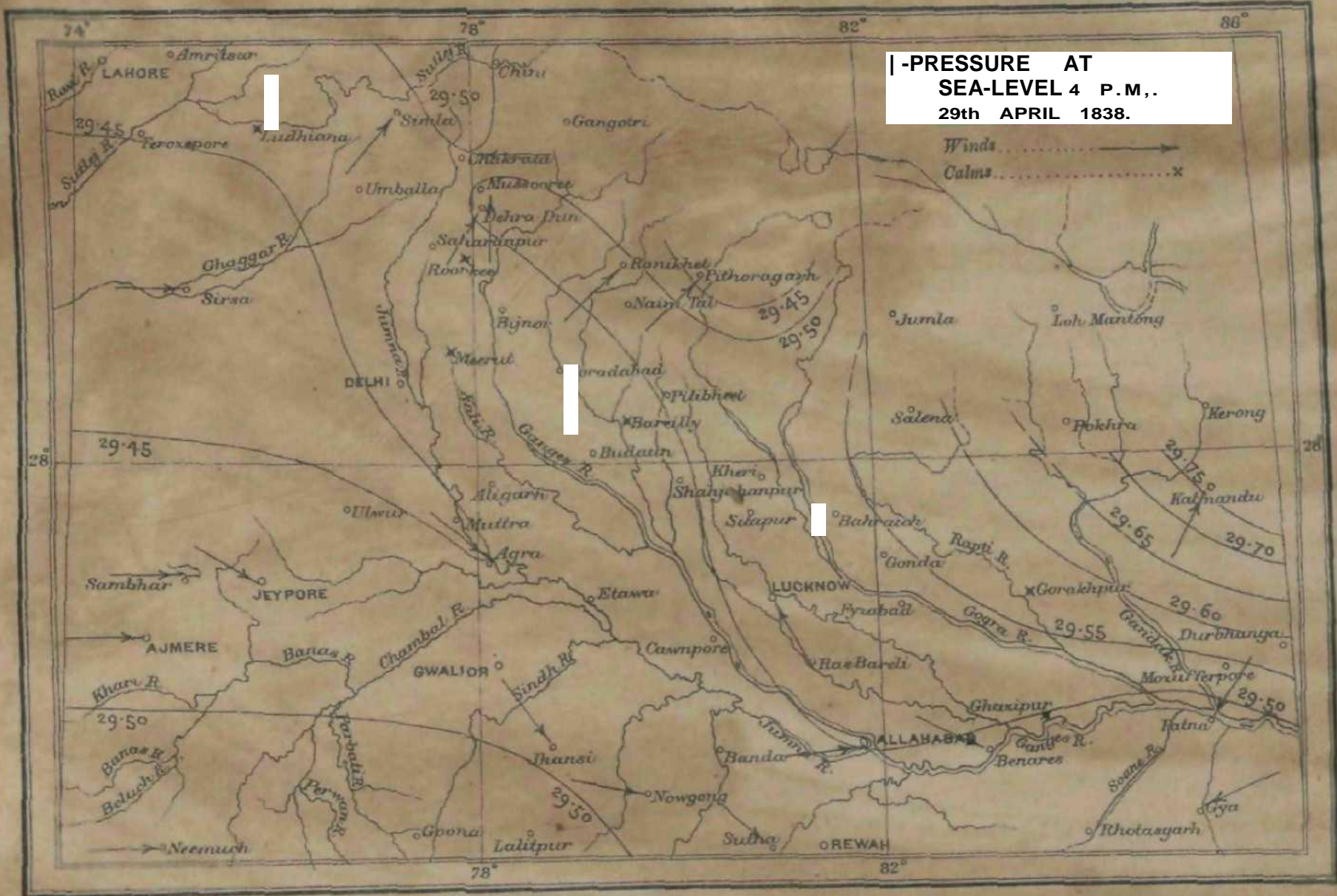
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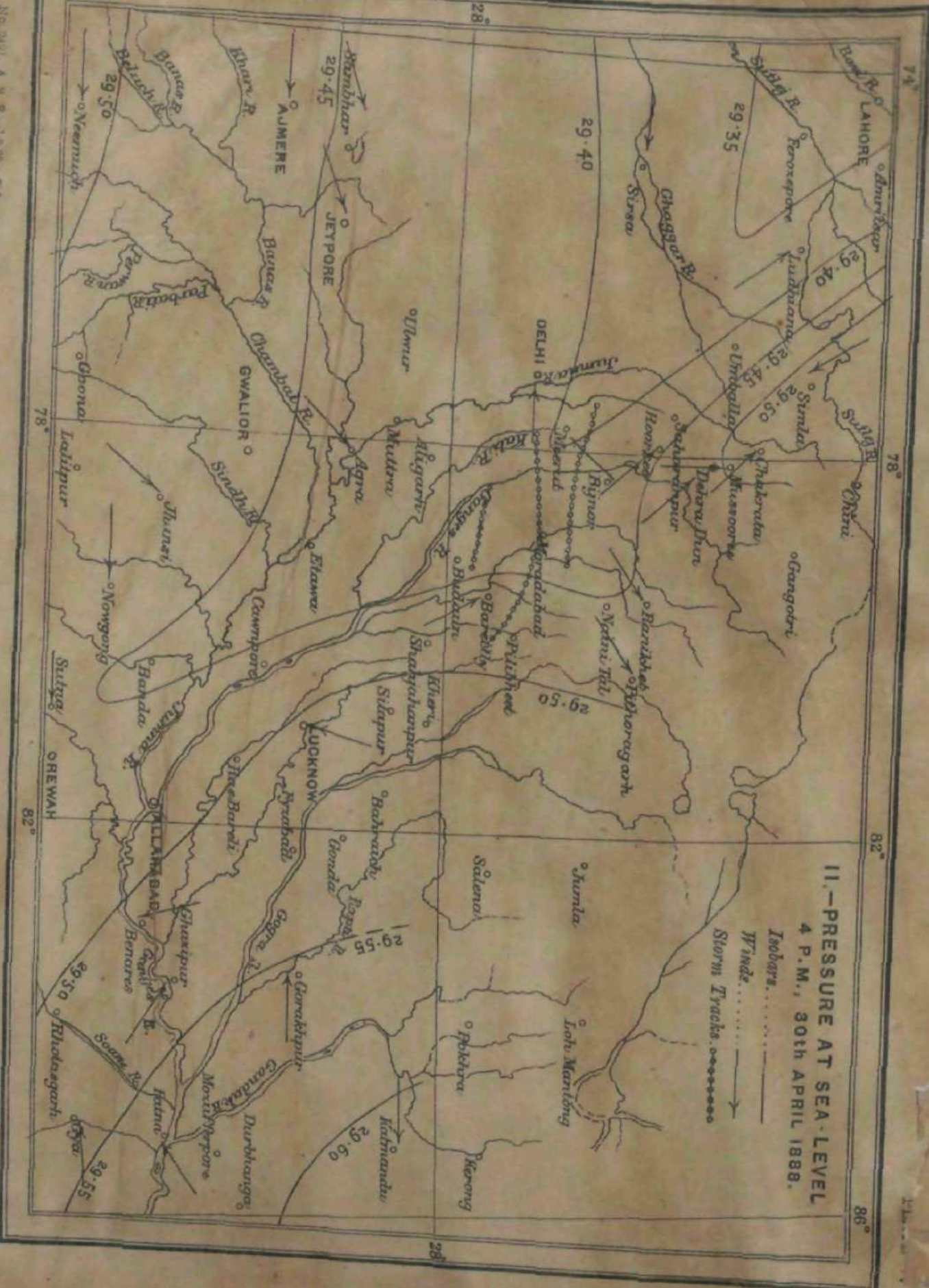






**BAROMETRIC PRESSURE AT
SEA-LEVEL 4 P.M.,
29th APRIL 1838.**



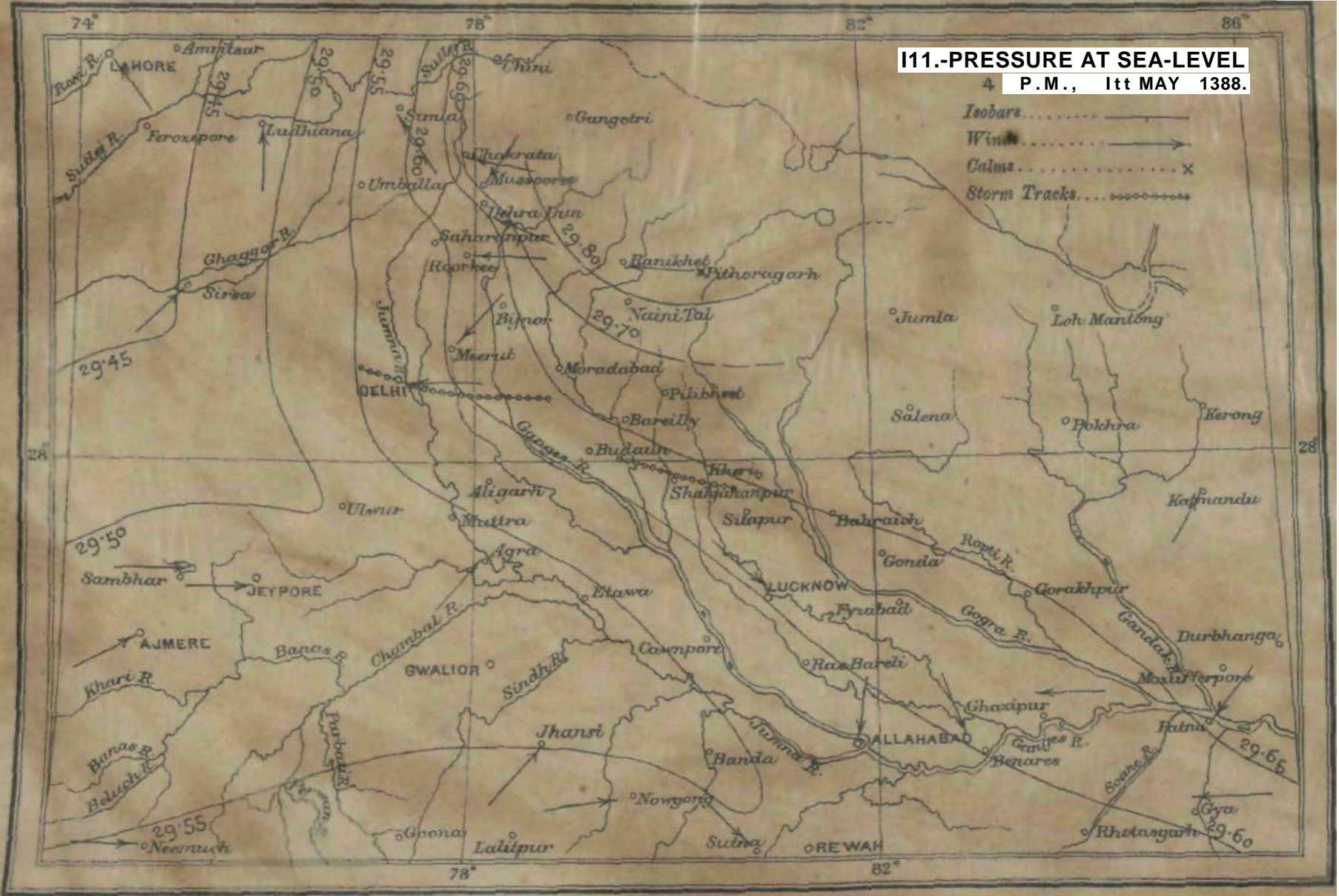


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4 P.M., 30th APRIL 1889.

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Winds.....
Storm Tracks.....

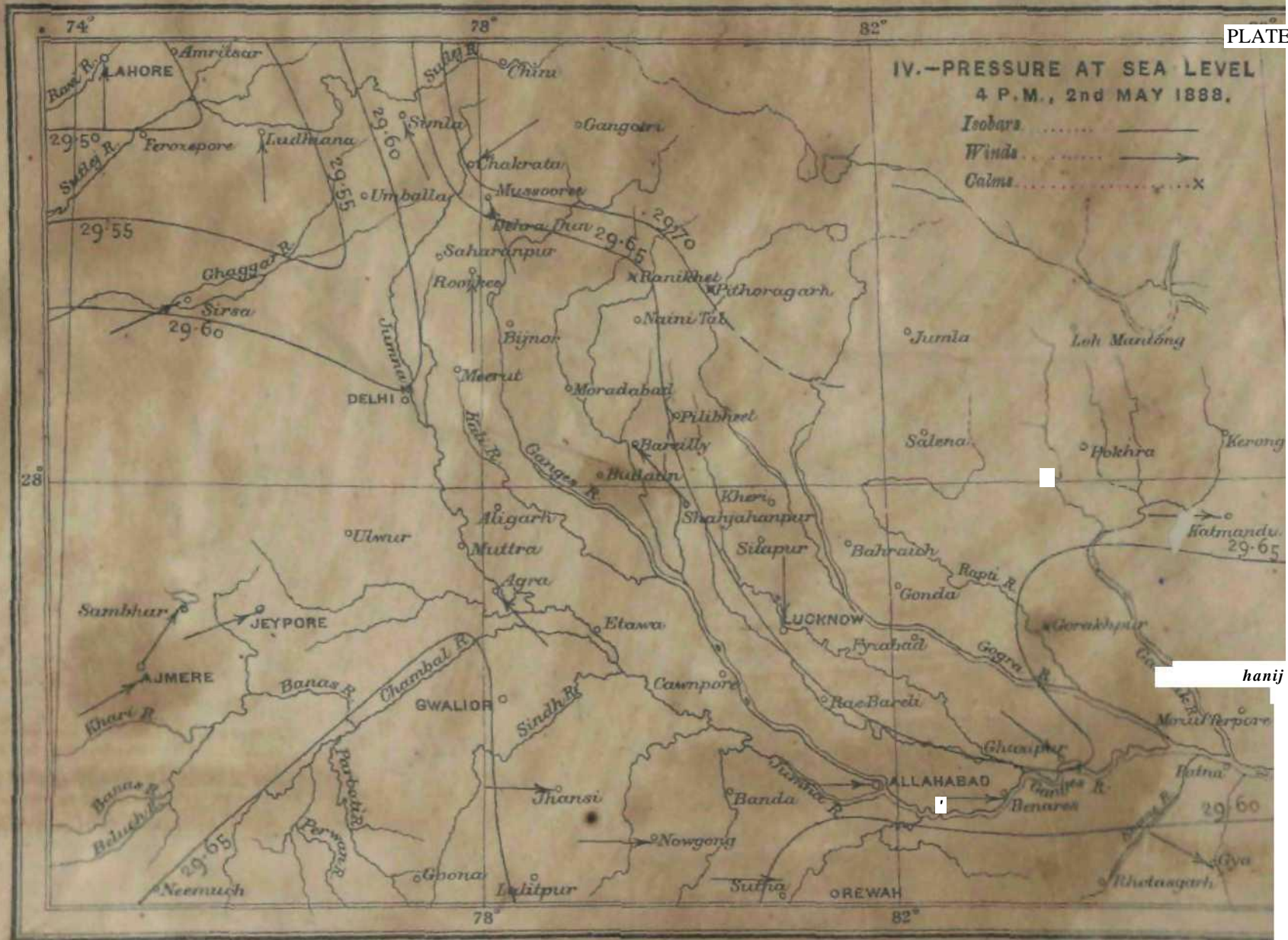
111.-PRESSURE AT SEA-LEVEL

4 P.M., 1st MAY 1388.



S. A..

PLATE



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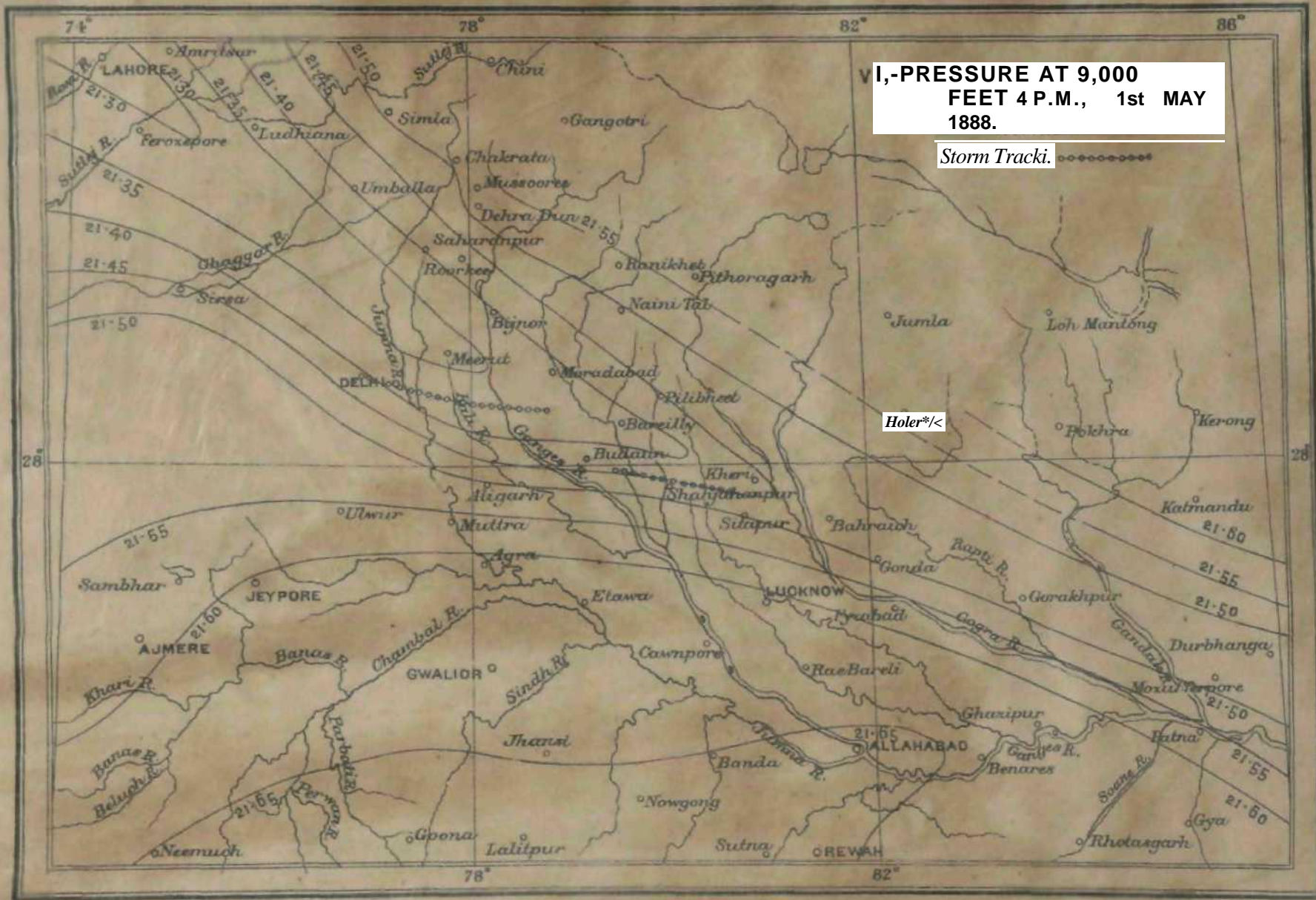


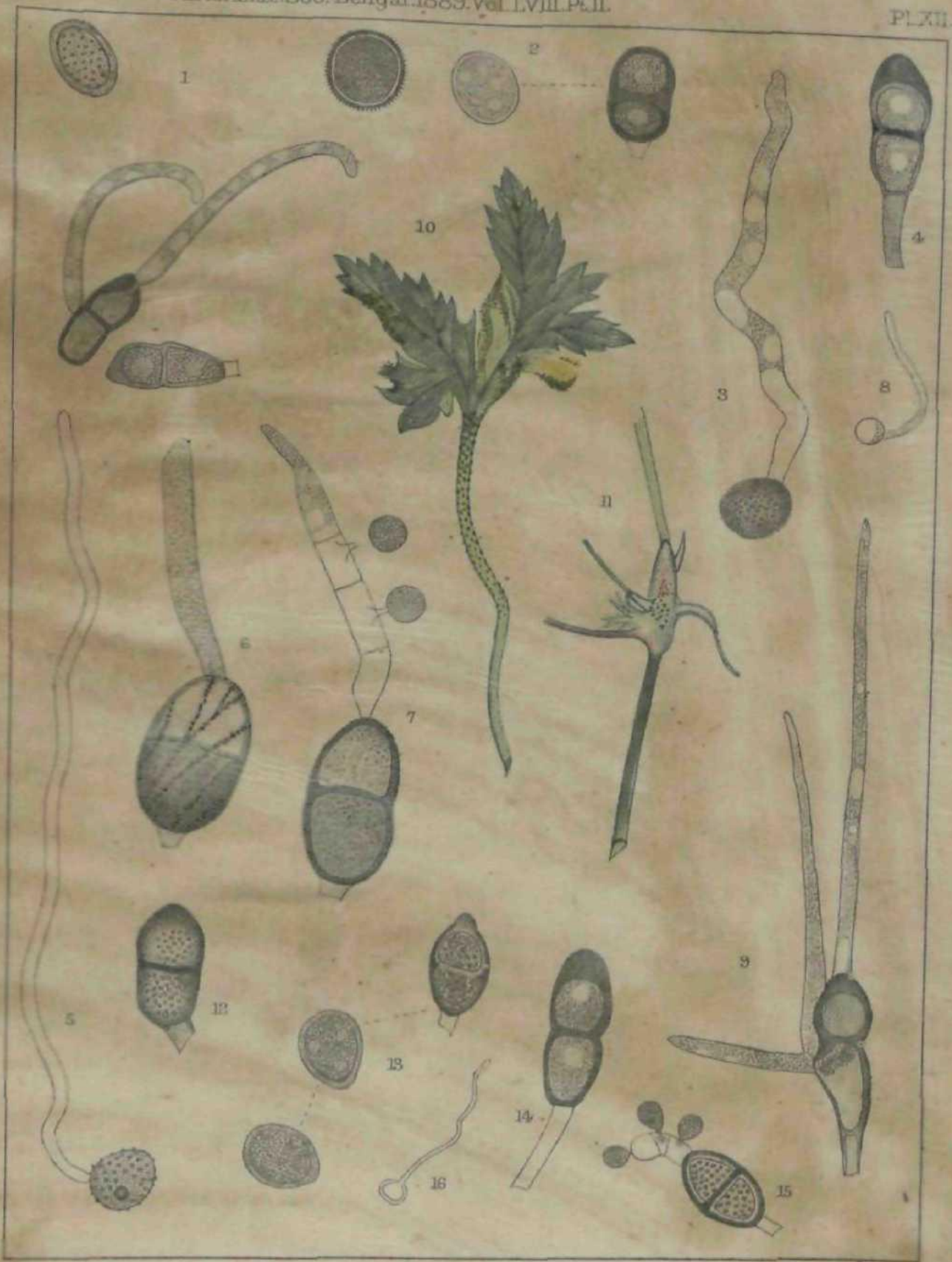




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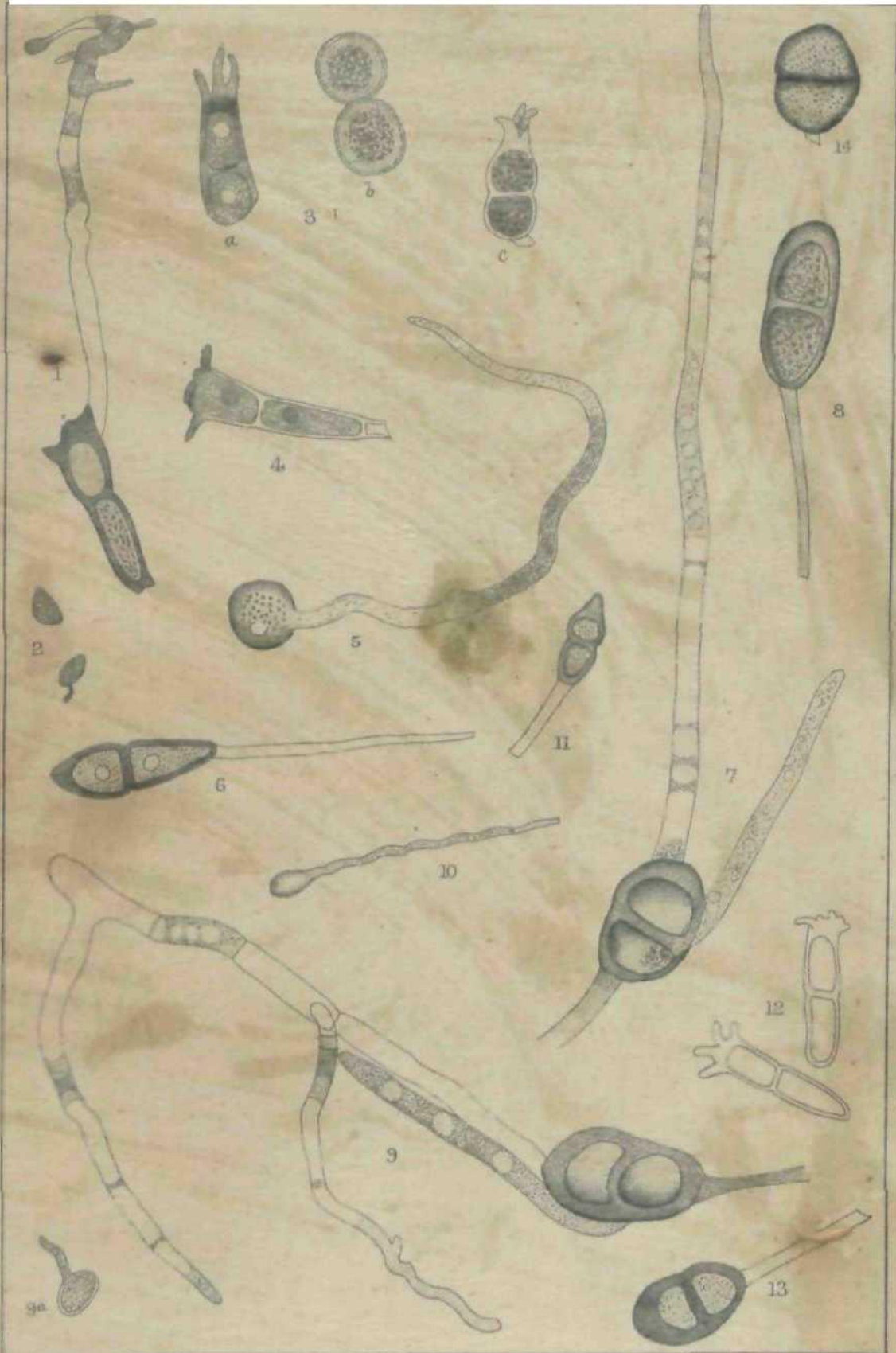




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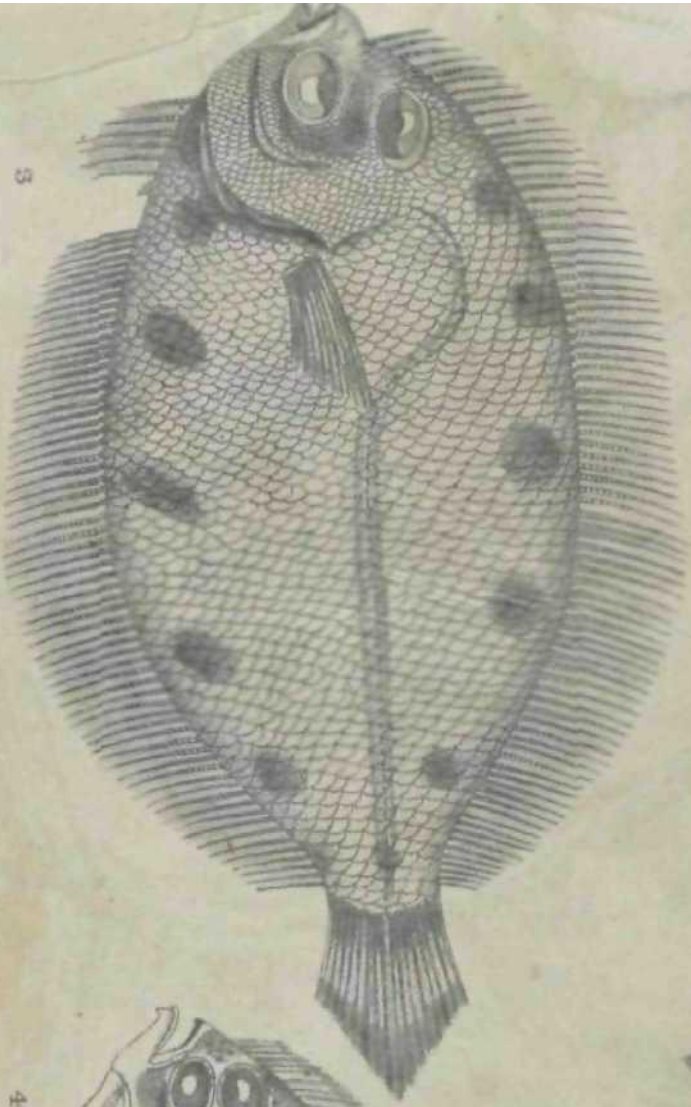


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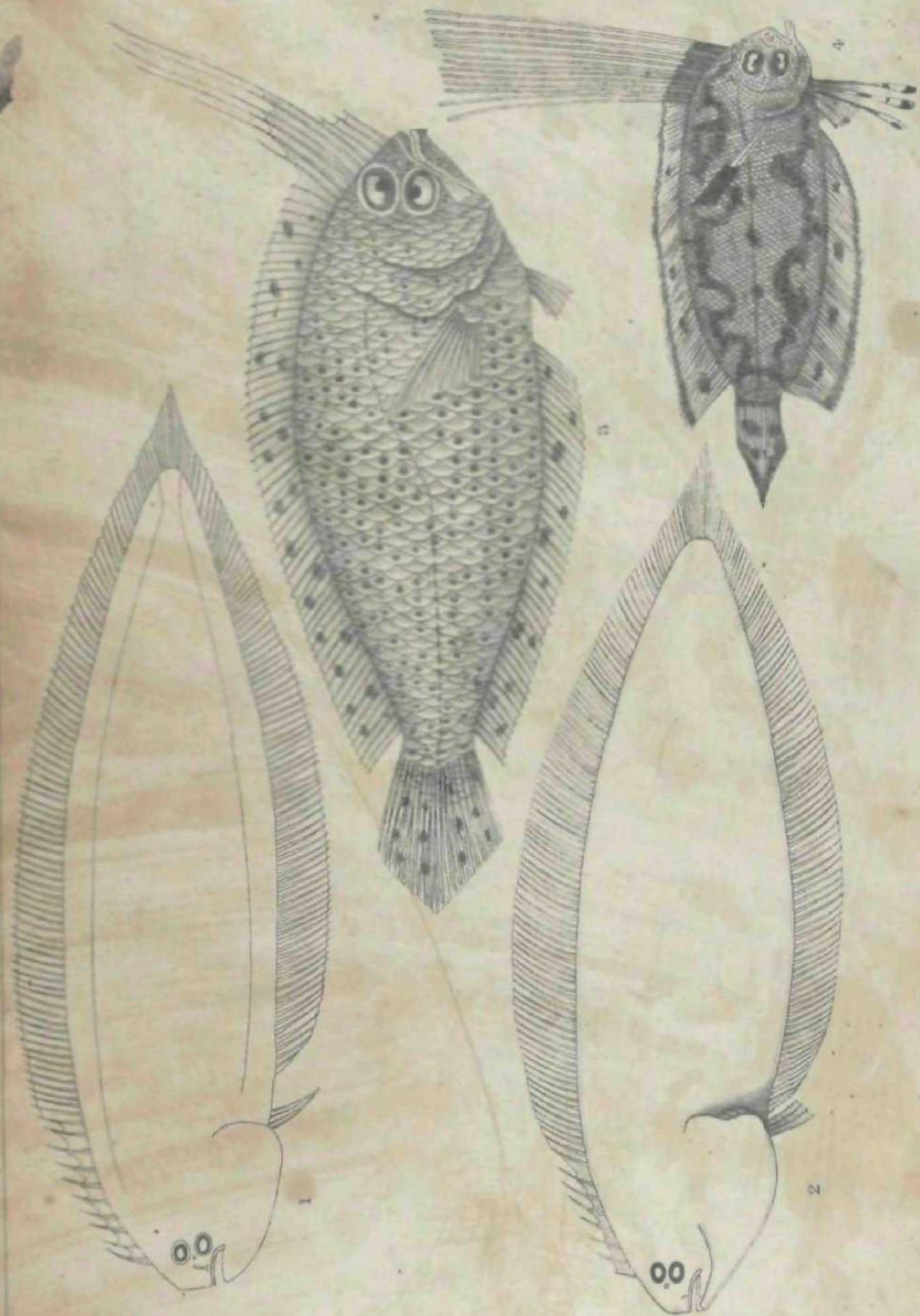


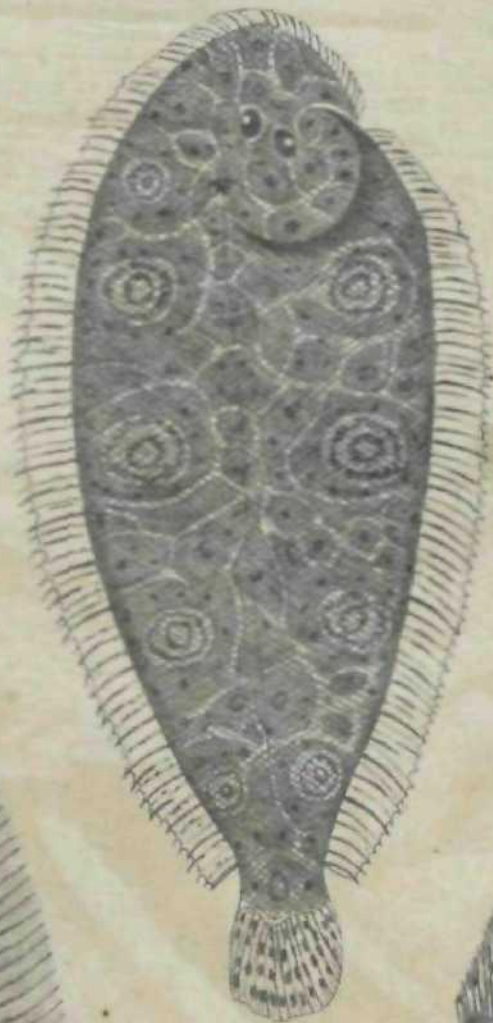
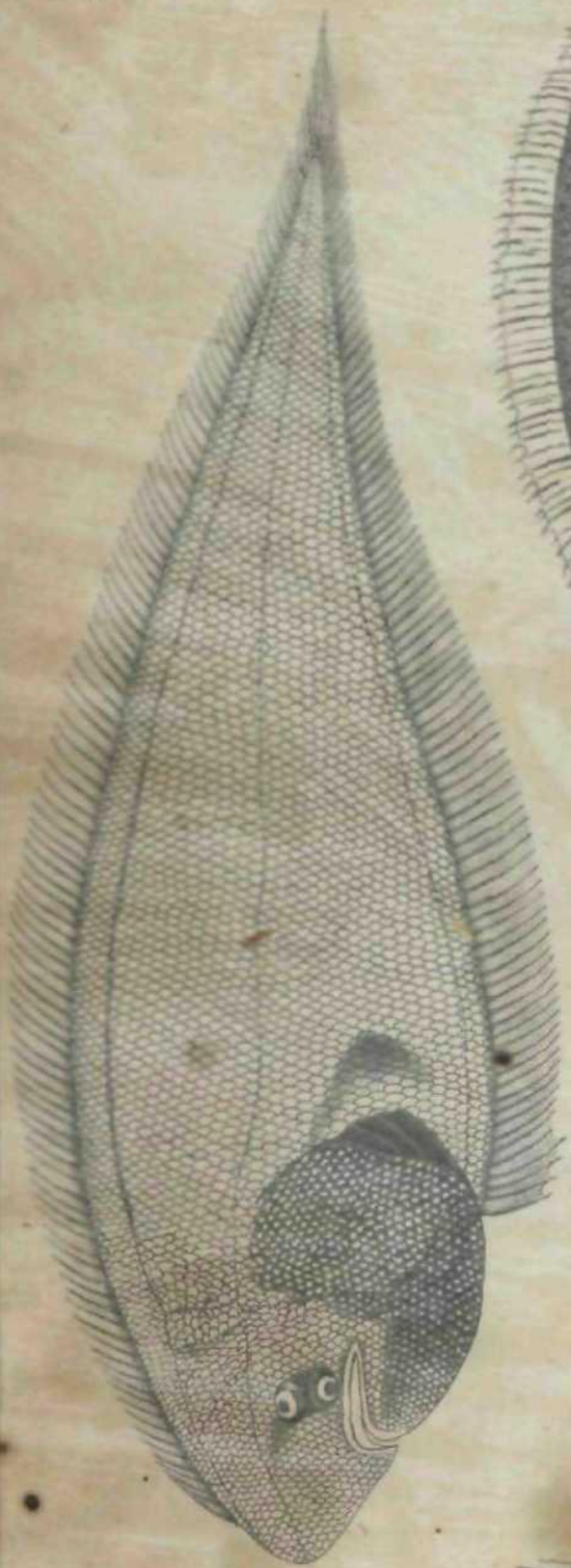
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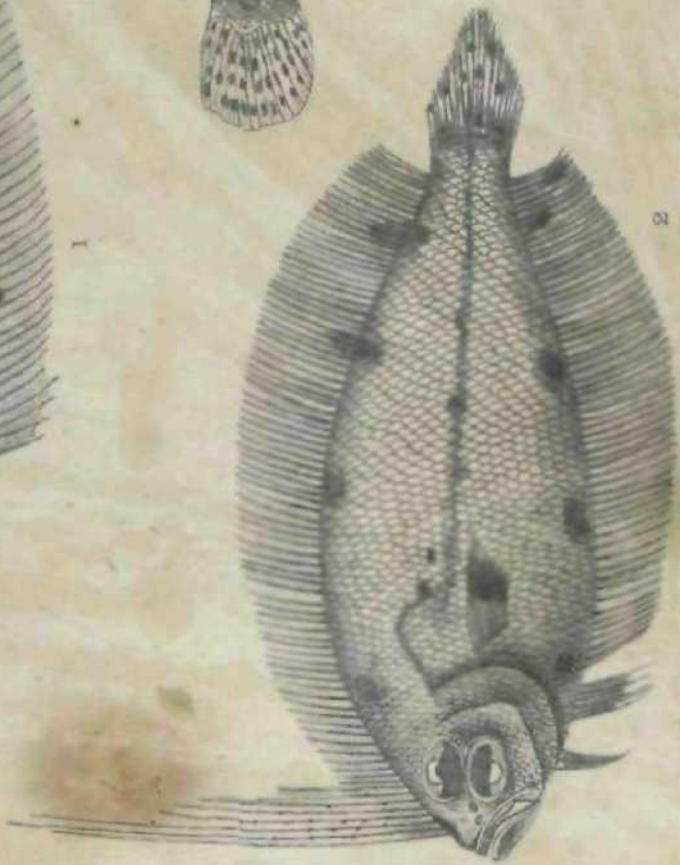
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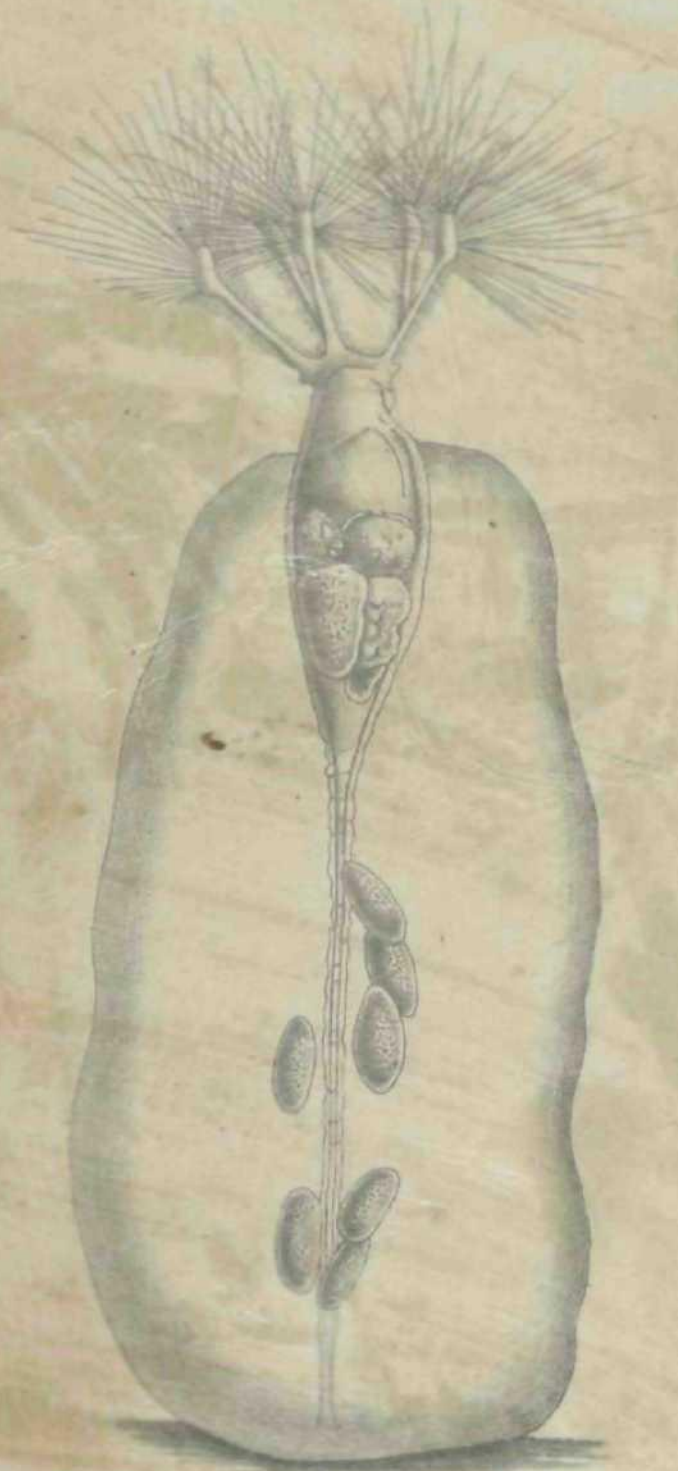




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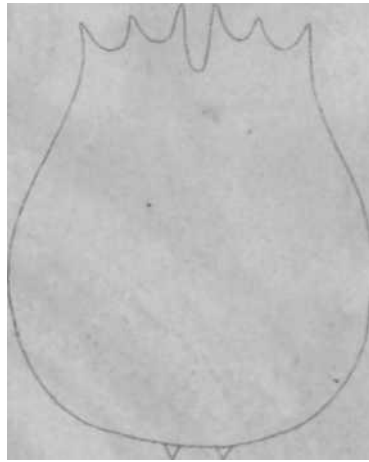
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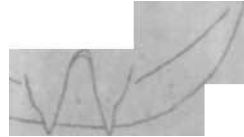
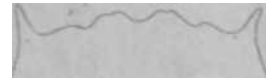
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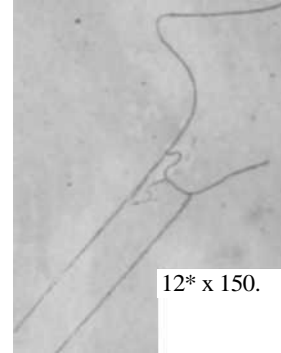
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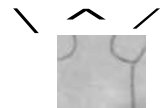
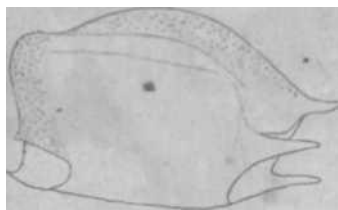
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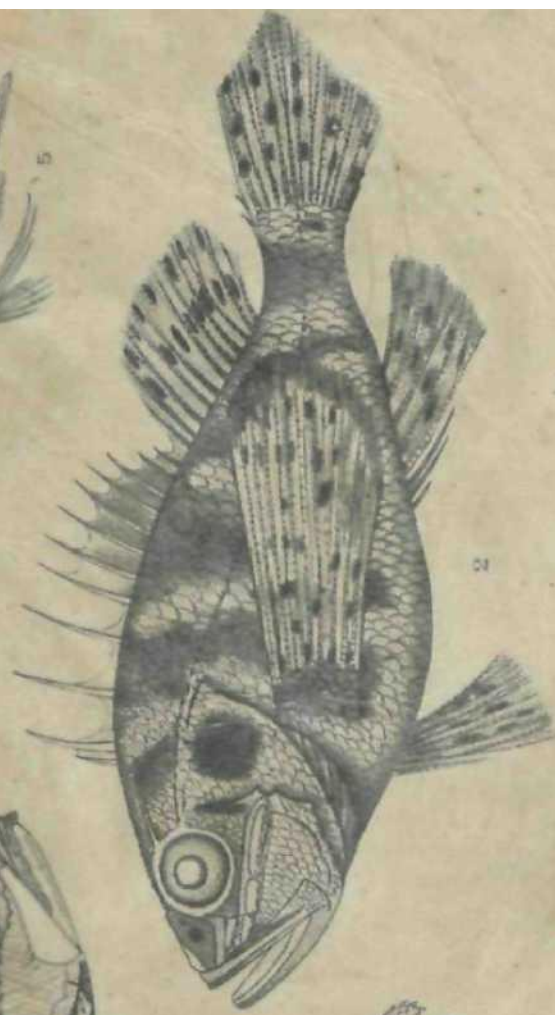
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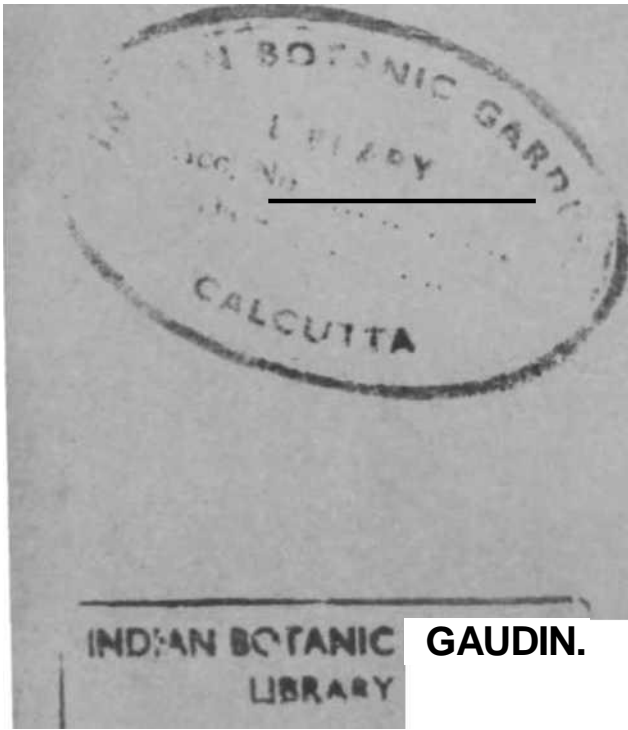


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