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A taxonomic guide to the ant genus *Orectognathus*
(Hymenoptera: Formicidae)

Robert W. Taylor

Division of Entomology
Commonwealth Scientific and Industrial Research Organization, Australia
1978

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Index to the microfiche edition

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A Taxonomic Guide to the Ant Genus *Orectognathus* (Hymenoptera: Formicidae)

Robert W. Taylor
Division of Entomology, CSIRO, P.O. Box 1700, Canberra City, A.C.T. 2601.

Abstract

Various computer programs are applied to input data derived from an *Orectognathus* species/character matrix, a species list and a list of the characters with their state descriptions. Output includes keys of several kinds and plain language descriptions of each species, published with an introduction on microfiche. The introduction, input data (comprising coded descriptions of all species), a bracket key and an index to the microfiche are published in printed form. *Orectognathus* was chosen for this pilot study because a recent conventional review (Taylor, R.W., 1977, *Aust. J. Zool.* **25**, 581-612) is available for comparison.

Introduction

This paper is experimental in approach and investigates the possibilities for computer generation of taxonomic literature. In this case coded descriptions of all twenty-nine known *Orectognathus* species were prepared using the DELTA (DEscriptive Language for TAxonomy) format devised by my colleague Dr M.J. Dallwitz. These, with a list of the characters used and their state descriptions, were then manipulated using the programs KEY (Dallwitz 1974) and SCRIPT to produce a tabular identification key, a conventional bracket key and expanded plain language descriptions of all species, with indications of their distribution and references, wherever possible, to appropriate modern illustrations of each.

The complete paper, comprising this introduction, the raw input data and the processed output material, is published in microfiche edition prepared automatically using the COM (Computer Output Microfilm) device at the CSIRO Division of Computing Research, Canberra. The introduction, coded input descriptions, list of characters and states and bracket key are also published, with an index to the microfiche edition, in printed form. This is reproduced from computer generated camera-ready copy. The introduction was typed from manuscript directly into a computer console to be edited, formated and typeset using the programs ED and TYPSET in the course of producing the camera-ready copy reproduced here.

Orectognathus was chosen for this pilot study because a recent conventional review of the genus (Taylor 1977) with a supplement due to appear soon (under the title "New Australian ants of the Genus *Orectognathus*, with Summary Descriptions of the Twenty-nine known species") is available for comparison.

It is not proposed to discuss now the possible significance to taxonomy of the techniques applied here. This will be done elsewhere. Suffice it to say that this paper is the first of a

projected series dealing with Australian ants, based largely on the holdings of the Australian National Insect Collection (ANIC). Future examples will differ from this one, because their subject genera will rarely have been previously reviewed or monographed, and many of the included species will be identified using ANIC ant species identification numbers [see Imai, Crozier and Taylor (1977), p. 344]. Such species are operationally not identifiable by name, usually because they have no names, or often because their nomenclature cannot be established without extensive study of the types of possible names, many of which are housed in European or North American museums. These projected guides will thus usually represent the first attempt at a taxonomic overview of the Australian species of their subject genera.

Three names cited here (*O. alligator, O. coccinatus* and *O. kanangra)* are proposed conditionally, pending their formal publication. Under Article 15 of *The International Code of Zoological Nomenclature* these must be considered "not available" until published in the forthcoming supplement to my 1977 review, referred to above.

Instructions for Reading DELTA Descriptions

The DELTA-format descriptions incorporated in both versions of this paper each comprise a series of numbered entries representing the serially numbered characters of the accompanying list of characters and states. The character numbers are usually followed by a further number in the case of numeric characters, or by a letter in the case of multistate characters. These indicate the state of the appropriate character expressed in the species being described. For example, 1,1.9mm in the *O. chyzeri* description indicates the value 1.9mm for character 1, "Maximum head length". The entry 2,A in the *O. alligator* description translates, through reference to the list of characters and states, to "Shafts of closed mandibles" (Character 2) "more-or-less parallel, apical teeth not notably reduced" (State A). If a character is not applicable to a particular species its number is followed by a dash. For example, character 12 is entered 12,- in the *0. biroi* description because it is not applicable — *biroi* lacks pronotal spines, the states of which are the subject of character 12.

Where two or more numbers or letters are entered as states of a given character the separators between them translate as follows: & represents "and", - represents "to", and / represents "or". Examples are 1,0.88-1.04 and 26,A&C in the description of *O. alligator*, and 3,A/B in that of *O. satan*.

Comments expanding or qualifying the individual descriptive entries are enclosed by angle brackets <thus>. Omitted characters (e.g. No. 16 in all species except *O. antennatus* and *O. sarasini*) have not been scored for the species concerned because they involve special details distinguishing closely similar species but unnecessary in describing others.

The Program KEY Output

KEY output includes a standard bracket key published with both versions of the paper. In addition a tabular key and a species/character matrix are given with the microfiche edition. The matrix embodies essentially the same information as the DELTA-format descriptions. The characters and states listed for KEY differ slightly from those of DELTA,

because of their special purpose.

Acknowledgments

This project would not have been possible without the patient and able support of Dr Dallwitz and my assistant Elizabeth Lockie. James Higgins developed the associated program PABTRAN, use of which enabled much of the original data to be entered manually onto computer readable cards using an IBM Port-a-Punch device.

The DELTA system will be discussed in detail elsewhere by Dallwitz (in preparation), and program PABTRAN by Higgins (in preparation). Copies of program TYPSET are available from Dr Dallwitz.

References

Dallwitz, M.J. (1974). A flexible computer program for generating identification keys. *Syst. Zool.* **23**, 50-7.

Imai, H.T., Crozier, R.H. and Taylor, R.W. (1977). Karyotype evolution in Australian ants. *Chromosoma* **59**, 341-93.

Taylor, R.W. (1977). New ants of the Australasian genus *Orectognathus*, with a key to the known species (Hymenoptera: Formicidae). *Aust. J. Zool.* **25**, 581-612.

Characters and states – DELTA format

#1. MAXIMUM HEAD LENGTH/
MM/
#2. SHAFTS OF CLOSED MANDIBLES/
A. MORE-OR-LESS PARALLEL, APICAL TEETH NOT NOTABLY REDUCED/
B. CONVERGING APICALLY, APICAL TEETH REDUCED IN SIZE/
#3. EACH INNER MANDIBULAR BORDER, JUST BASAD OF APICAL TEETH,/
A. WITH ITS MARGINAL FLANGE FORMING A STRONG TOOTH-LIKE PROCESS, ACUTE TO SUBACUTE AT TIP/
B. WITH ITS MARGINAL FLANGE EXPANDED AS A ROUNDED PROCESS, NOT TOOTH-LIKE/
C. WITH A MINUTE SUBACUTE ANGLE OR DENTICLE FORMING THE APICAL CORNER OF ITS NARROW MARGINAL FLANGE/
D. WITHOUT ARMAMENT (MARGINAL FLANGE IF PRESENT FOLLOWING CONTOUR OF JAW, BUT NOT ITSELF EXPANDED)/
#4. BASAL TWO-THIRDS OF INNER MANDIBULAR BORDERS/
A. NOT CONCAVE (STRAIGHT, FEEBLY CONVEX OR FEEBLY SINUOUS)/
B. SHALLOWLY BUT DISTINCTLY CONCAVE/
#5. EYES/
A. OF NORMAL SIZE, PLACED BEHIND LEVEL OF ANTENNAL FOSSAE/
B. ENLARGED, DISPLACED FORWARDS TO ABOUT LEVEL OF ANTENNAL FOSSAE/
#6. ANTEOCULAR DENTICLES/
A. PRESENT, DISTINCT, SHARPLY POINTED/
B. REPRESENTED BY LOW ROUNDED TUMOSITIES, ABOUT AS HIGH AS FRONTAL LOBES/
C. LACKING/
#7. FRONS/
A. WITH DENSE, LARGE FOVEAE, AVERAGE SPACING LESS THAN THEIR MEAN DIAMETER/
B. WITH SCATTERED, WEAKLY IMPRESSED FOVEAE, INTERSPACES STRONGLY SHINING/
C. SMOOTH AND SHINING, LACKING FOVEAE/
D. DENSELY SHAGREENED, OPAQUE, MACROSCULPTURAL FOVEAE FEW, WEAKLY IMPRESSED/
#8. MEDIAN FRONTAL TEETH/
A. PRESENT/
B. LACKING/
#9. OCCIPITAL EMARGINATION/
A. EXCEPTIONALLY DEEP, ITS SIDES ENCLOSING AN ANGLE OF LESS THAN 25 DEGREES/
B. NEITHER EXCEPTIONALLY DEEP NOR SHALLOW, ITS SIDES ENCLOSING AN ANGLE WITHIN THE RANGE 50 TO 90 DEGREES/
C. EXCEPTIONALLY SHALLOW, ITS SIDES ENCLOSING AN ANGLE OF AROUND 100 DEGREES/
#10. APICES OF OCCIPITAL LOBES/
A. BROADLY ROUNDED/
B. EACH DRAWN TO A BLUNT POINT BUT NOT SPINOSE/
C. EACH BEARING AN ACUTE SPINE/
#11. PRONOTAL HUMERI/
A. ARMED/
B. ROUNDED, LACKING ARMAMENT/
#12. PRONOTAL SPINES/
A. DISTINCTLY LARGER THAN ANTEOCULAR DENTICLES/
B. AT MOST BARELY LARGER THAN ANTEOCULAR DENTICLES/
#13. VENTROLATERAL MARGINS OF PRONOTUM/
A. BROADLY ROUNDED/
B. WITH STRONG SALIENT ANGLES/
#14. MESONOTAL PROFILE/
A. SIMPLE/
B. COMPLEX/
#15. MESONOTUM/
A. ARMED WITH TWO PAIRS OF RAISED TUBERCLES, THE POSTERIOR PAIR THE LARGER, ACUTELY SUBDENTATE/
B. ARMED WITH TWO PAIRS OF VERY LOW ROUNDED TUMOSITIES, SUBEQUAL IN SIZE AND

CONVEXITY/
C. ARMED ONLY WITH A PAIR OF STRONG ERECT SPINES, LACKING TRACES OF ANTERIOR TUBERCLES/

#16. HUMERAL AND ANTERIOR MESONOTAL TUBERCLES/
A. RELATIVELY POORLY DEVELOPED/
B. RELATIVELY WELL DEVELOPED/

#17. PROPODEAL SPINES/
A. VERY REDUCED, MUCH SMALLER THAN PRONOTALS AND NO LARGER THAN ANTEOCULAR DENTICLES/
B. NOT SMALLER THAN PRONOTALS/

#18. PETIOLAR NODE/
A. ROUNDED ABOVE, WITHOUT TRANSVERSE CREST OR DORSOLATERAL ARMAMENT/
B. PRISMATIC, WITH TRANSVERSE CREST AND DISTINCT DORSOLATERAL CORNERS/
C. DISTINCTLY DORSOLATERALLY BIDENTATE/

#19. POSTPETIOLE/
A. DISTINCTLY LONGER THAN BROAD IN DORSAL VIEW/
B. NOT LONGER THAN BROAD IN DORSAL VIEW/

#20. SUBPOSTPETIOLAR PROCESS/
A. PRESENT, ACUTELY DIGITATE/
B. LACKING/

#21. DORSAL PROFILES OF MESOSOMA, PETIOLE AND POSTPETIOLE/
A. BROKEN BY NUMEROUS FINE, SHORT, ERECT HAIRS/
B. BROKEN BY FEW, IF ANY, ERECT HAIRS/

#22./
A. HEAD AND MESOSOMA BROWNISH RED, GASTER BROWNISH YELLOW/
B. HEAD AND MESOSOMA BLACK OR PICEOUS, GASTER YELLOW/

#23./
A. DISTINCT SOLDIER CASTE PRESENT ADDITIONAL TO "NORMAL" WORKERS/
B. DISTINCT SOLDIER CASTE NOT DIFFERENTIATED/

#24. DISTRIBUTION/
A. NEW GUINEA/
B. NEW ZEALAND (NORTH ISLAND)/
C. NEW CALEDONIA/
D. AUSTRALIA/

#25./
A. LORD HOWE ISLAND/
B. FAR NORTHEAST QUEENSLAND (IRON RANGE)/
C. NORTHEAST QUEENSLAND (BASE OF PENINSULA)/
D. CENTRAL EASTERN QUEENSLAND/
E. SOUTHEAST QUEENSLAND/
F. NORTHEAST NEW SOUTH WALES/
G. CENTRAL EASTERN NEW SOUTH WALES/
H. SOUTHEAST NEW SOUTH WALES/
I. VICTORIA/
J. TASMANIA/
K. SOUTHEAST SOUTH AUSTRALIA/
L. SOUTHWEST WESTERN AUSTRALIA/

#26. ILLUSTRATED IN/
A. ANIC MICROGRAPH FILE/
B. TAYLOR, 1977 (AUSTRALIAN JOURNAL OF ZOOLOGY 25, 581-612.)/
C. TAYLOR, 1979 (IN PRESS)./
D. TAYLOR & LOWERY, 1972 (JOURNAL OF THE AUSTRALIAN ENTOMOLOGICAL SOCIETY 11, 306-310.)/
E. BROWN, 1957 (PSYCHE, CAMBRIDGE MASS. 64, 17-29.)/
F. LOWERY, 1967 (JOURNAL OF THE AUSTRALIAN ENTOMOLOGICAL SOCIETY 6, 137-140.)/

#27. COMMENTS:/

Species descriptions – DELTA format

```
1.01    # ALLIGATOR TAYLOR/
1.02    1,0.88-1.04 2,A 3,C 4,A 5,A 6,A 7,A 8,B 9,B 10,A 11,A 12,B 13,B 14,A
1.03    15,- 17,B<DIFFERENCE SLIGHT> 18,A 19,B 20,B 21,B 23,B 24,D 25,C&D 26,A&C

2.01    # ANTENNATUS FR. SMITH/
2.02    1,1.31-1.60 2,A 3,B 4,A 5,A 6,C 7,A 8,B 9,B 10,A 11,A 12,- 13,A 14,B
2.03    15,A 16,A<COMPARED TO SARASINI> 17,B 18,B 19,B 20,B 21,B 23,B 24,B&D
2.04    25,E&F&G 26,B

3.01    # BIROI SZABO/
3.02    1,1.43-1.46 2,B 3,D 4,A 5,A 6,C 7,C 8,B 9,B 10,B<TENDING TO ROUNDED>
3.03    11,B 12,- 13,A 14,A 15,- 17,- 18,A 19,A 20,B 21,B 22,A 23,B 24,A 26,B

4.01    # CHYZERI EMERY/
4.02    1,1.19<N=1> 2,B 3,D 4,A 5,A 6,C 7,B 8,B 9,B 10,B 11,B 12,- 13,A 14,A
4.03    15,- 17,- 18,A 19,B 20,B 21,B 23,B 24,A

5.01    # CLARKI BROWN/
5.02    1,1.16-1.52 2,A 3,D 4,B 5,A 6,A 7,A<TENDING TO RUGOSITY> 8,B 9,B 10,A
5.03    11,A 12,A<DIFFERENCE SLIGHT> 13,A 14,B 15,A 17,B<DIFFERENCE SLIGHT> 18,B
5.04    19,B 20,B 21,B 23,B 24,D 25,E&F&G&H&I&J&K&L 26,B

6.01    # COCCINATUS TAYLOR/
6.02    1,0.80-0.90 2,B 3,D 4,A 5,B 6,A<SMALL> 7,A 8,B 9,B 10,A 11,A 12,A 13,A
6.03    14,A 15,- 17,B<DIFFERENCE SLIGHT> 18,A 19,B 20,B 21,B 23,B 24,D 25,D
6.04    26,A&C

7.01    # CZIKII SZABO/
7.02    1,1.22<CEPHALIC INDEX 84 (N=1)> 2,A 3,C<DENTICLE> 4,A 5,A 6,A 7,A 8,A
7.03    9,B<ABOUT 65 DEGREES> 10,A 11,A 12,A 13,A 14,B 15,C 17,B 18,C 19,B 20,B
7.04    21,A 23,B 24,A 26,D

8.01    # DARLINGTONI TAYLOR/
8.02    1,1.34-1.53 2,A 3,D 4,A 5,A 6,C<SOMETIMES VESTIGIAL> 7,A 8,B 9,B 10,A
8.03    11,A 12,- 13,A 14,B 15,A<ANTERIOR PAIR RELATIVELY LOW > 17,B 18,B 19,A
8.04    20,B 21,B 23,B 24,D 25,C 26,A&B

9.01    # ECHINUS TAYLOR & LOWERY/
9.02    1,1.64-1.90<CEPHALIC INDEX 56-62> 2,A 3,A 4,A 5,A 6,A 7,A 8,A 9,A 10,A
9.03    11,A 12,A 13,A 14,B 15,C 17,B<DIFFERENCE SLIGHT> 18,C 19,A<NOT GREATLY
9.04    SO> 20,B 21,A 23,B 24,A 26,A&D

10.01   # ELEGANTULUS TAYLOR/
10.02   1,1.04-1.18 2,A 3,D 4,A-B 5,A 6,A<SMALL, OBTUSE> 7,A 8,B 9,B 10,A 11,A
10.03   12,A 13,A 14,B 15,A 17,B 18,A 19,B 20,B 21,B 23,B 24,D 25,E&F 26,A&B

11.01   # HORVATHI SZABO/
11.02   1,1.14<N=1> 2,B 3,D 4,A 5,A 6,C 7,C 8,B 9,B 10,C<DRAWN OUT FROM APEX>
11.03   11,B 12,- 13,A 14,A 15,- 17,- 18,A 19,A 20,B 21,B 23,B 24,A 26,B

12.01   # HOWENSIS WHEELER/
12.02   1,1.24-1.42 2,A 3,A 4,A 5,A 6,C 7,A 8,B 9,B 10,A 11,A 12,- 13,A 14,B
12.03   15,A 17,B 18,B 19,B 20,B 21,B 23,B 25,A 26,B

13.01   # HYSTRIX TAYLOR & LOWERY/
13.02   1,1.38-1.54 2,A 3,A 4,A 5,A 6,A<SMALL> 7,B<FOVEAE VESTIGIAL> 8,B 9,B
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13.03   10,C<FREESTANDING> 11,A 12,A 13,A 14,B 15,C 17,B<DIFFERENCE SLIGHT> 18,C
13.04   19,A 20,B 21,B 23,B 24,A 26,A&D

14.01   # KANANGRA TAYLOR/
14.02   1,1.00<N=1> 2,A 3,C<VESTIGIAL> 4,A 5,A 6,A 7,A 8,B 9,B 10,A 11,A 12,A
14.03   13,B<SUBDENTATE> 14,A 15,- 17,B<DIFFERENCE SLIGHT> 18,A 19,B 20,A 21,B
14.04   23,B 24,D 25,G 26,A&C

15.01   # LONGISPINOSUS DONISTHORPE/
15.02   1,1.20-1.48 2,B 3,D 4,A 5,A 6,C 7,C 8,B 9,B 10,B 11,B 12,- 13,A 14,A
15.03   15,- 17,- 18,A 19,A 20,B 21,B 22,B 23,B 24,A

16.01   # MJOBERGI FOREL/
16.02   1,1.22-1.50 2,A 3,D 4,A 5,A 6,B 7,A 8,B 9,B 10,A 11,A 12,- 13,A<TENDING
16.03   TO OBTUSELY ANGLED> 14,B 15,A 17,B 18,B 19,B 20,B 21,B 23,B 24,D
16.04   25,C&D&E&F 26,B

17.01   # NANUS TAYLOR/
17.02   1,0.64-0.74 2,B 3,D 4,A 5,B 6,A<SMALL, SOMETIMES VESTIGIAL> 7,A 8,B 9,C
17.03   10,A 11,A 12,A 13,A 14,A 15,- 17,B<DIFFERENCE SLIGHT> 18,A 19,B 20,B
17.04   21,A 23,B 24,D 25;C 26,A&B

18.01   # NIGRIVENTRIS MERCOVICH/
18.02   1,1.01-1.25 2,A 3,D 4,A-B 5,A 6,A 7,B 8,B 9,B 10,A 11,A 12,A 13,A 14,B
18.03   15,A 17,B<DIFFERENCE SLIGHT> 18,C 19,B 20,B 21,B<USUALLY A FEW ON
18.04   MESONOTUM, AND ELSEWHERE IN OCCASIONAL SPECIMENS> 23,B 24,D 25,G&H 26,E

19.01   # PARVISPINUS TAYLOR/
19.02   1,0.96-1.10 2,A 3,C 4,A 5,A 6,A 7,A 8,B 9,B 10,A 11,A 12,A 13,B 14,A
19.03   15,- 17,A 18,A 19,B 20,B 21,B 23,B 24,D 25,D 26,A&B

20.01   # PHYLLOBATES BROWN/
20.02   1,0.96-1.12 2,A 3,D 4,B 5,A 6,A 7,C<SCATTERED FINE TO COARSE POINT
20.03   PUNCTURES PRESENT> 8,B 9,B 10,A 11,A 12,A 13,A 14,B 15,A<POSTERIOR PAIR
20.04   RELATIVELY SMALL> 17,B<DIFFERENCE SLIGHT> 18,C 19,B 20,B 21,A 23,B 24,D
20.05   25,E&F 26,E

21.01   # ROBUSTUS TAYLOR/
21.02   1,0.85-1.05 2,A 3,C 4,A 5,A 6,A 7,A 8,B 9,B 10,A 11,A 12,A 13,B 14,A
21.03   15,- 17,B<DIFFERENCE SLIGHT> 18,A 19,B 20,B 21,B 23,B 24,D 25,B&C&E
21.04   26,A&B

22.01   # ROOMI TAYLOR/
22.02   1,1.58<N=1> 2,A 3,A 4,A 5,A 6,C<SLIGHT VESTIGES PRESENT> 7,D 8,B 9,B
22.03   10,C<FREESTANDING> 11,A 12,- 13,A 14,B 15,C 17,B<DIFFERENCE SLIGHT> 18,C
22.04   19,A 20,B 21,B 23,B 24,A 26,A&B

23.01   # ROSTRATUS LOWERY/
23.02   1,0.70-0.79 2,B 3,D 4,A 5,B 6,A<SMALL, SOMETIMES VESTIGIAL> 7,B 8,B 9,C
23.03   10,A 11,A 12,A 13,A<TENDING TO OBTUSELY ANGLED> 14,A 15,- 17,B 18,A 19,B
23.04   20,B 21,A 23,B 24,D 25,E&F 26,F

24.01   # SARASINI EMERY/
24.02   1,1.07-1.26 2,A 3,B 4,A 5,A 6,C 7,A 8,B 9,B 10,A 11,A 12,- 13,A 14,B
24.03   15,A 16,B<COMPARED TO ANTENNATUS> 17,B 18,B 19,B 20,B 21,B 23,B 24,C
24.04   26,A&C

25.01   # SATAN BROWN/
25.02   1,1.36-1.57 (<EXCLUDING OCCIPITAL SPINES> 2,A 3,A/B<INTERMEDIATE> 4,A 5,A
25.03   6,C 7,A 8,B 9,B<APPROACHING 90 DEGREES> 10,C<DRAWN OUT FROM APEX>
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25.04 11,A<WITH WEAK TUBERCLES> 12,- 13,A 14,B 15,A/B<GEOGRAPHICALLY VARIABLE>
25.05 17,B 18,C 19,B 20,B 21,B 23,B 24,D 25,C 26,B 27<POPULATIONS WITH 15A
25.06 ALSO HAVE 11A (WITH STRONG TUBERCLES)>

26.01 # SEXSPINOSUS FOREL/
26.02 1,1.20-1.24<N=3> 2,A 3,D 4,A 5,A 6,A<SMALL> 7,B 8,B 9,B 10,A 11,A 12,A
26.03 13,A 14,B 15,A<ANTERIOR PAIR WEAK, ROUNDED; POSTERIOR PAIR ERECT SPINES>
26.04 17,B 18,A 19,A 20,B 21,A 23,B 24,D 25,C 26,B

27.01 # SZENTIVANYI (BROWN)/
27.02 1,1.31-1.43 2,B 3,D 4,A 5,A 6,C 7,C 8,B 9,B 10,A 11,B 12,- 13,A 14,A
27.03 15,- 17,- 18,A 19,A 20,B 21,B 23,B 24,A 26,E

28.01 # VELUTINUS TAYLOR/
28.02 1,1.26-1.32<N=2> 2,B 3,D 4,A 5,A 6,C 7,D 8,B 9,B 10,C<A FLATTENED
28.03 TRIANGLE, FREESTANDING> 11,B 12,- 13,A 14,A 15,- 17,- 18,A 19,B 20,B
28.04 21,B 23,B 24,A 26,A&B

29.01 # VERSICOLOR DONISTHORPE/
29.02 1,1.16-2.12<INCLUDING MAJORS> 2,A 3,D 4,A 5,A 6,A<OBTUSELY SO>
29.03 7,A<TENDING TO RUGOSITY> 8,B 9,B 10,A 11,A 12,A 13,A 14,B 15,A 17,B 18,B
29.04 19,B 20,B 21,B 23,A 24,D 25,D&E&F&G&H 26,B

Key to species

ANT GENUS ORECTOGNATHUS
****

PROGRAM KEY. RUN AT 20.37 ON 27/09/78. STORAGE REQUIRED - 2506 WORDS.

CHARACTERS - 24 READ, 24 MASKED, 23 USED IN KEY.
ITEMS - 32 READ, 32 MASKED, 29 APPEAR IN KEY; 29 TAXA.

RBASE = 1.40, ABASE = 2.00, REUSE = 1.01, VARYWT = .800, NCONF = 2

1.	(0)	MESONOTAL PROFILE SIMPLE	2
		MESONOTAL PROFILE COMPLEX	13
2.	(1)	PRONOTAL HUMERI ARMED; ANTEOCULAR DENTICLES PRESENT, DISTINCT, SHARPLY POINTED; DISTRIBUTION AUSTRALIA	3
		PRONOTAL HUMERI ROUNDED, LACKING ARMAMENT; ANTEOCULAR DENTICLES LACKING; DISTRIBUTION NEW GUINEA	9
3.	(2)	EYES OF NORMAL SIZE, PLACED BEHIND LEVEL OF ANTENNAL FOSSAE; SHAFTS OF CLOSED MANDIBLES MORE-OR-LESS PARALLEL, APICAL TEETH NOT NOTABLY REDUCED; VENTROLATERAL MARGINS OF PRONOTUM WITH STRONG SALIENT ANGLES	4
		EYES ENLARGED, DISPLACED FORWARDS TO ABOUT LEVEL OF ANTENNAL FOSSAE; SHAFTS OF CLOSED MANDIBLES CONVERGING APICALLY, APICAL TEETH REDUCED IN SIZE; VENTROLATERAL MARGINS OF PRONOTUM BROADLY ROUNDED	7
4.	(3)	PROPODEAL SPINES VERY REDUCED, MUCH SMALLER THAN PRONOTALS AND NO LARGER THAN ANTEOCULAR DENTICLES	PARVISPINUS
		PROPODEAL SPINES NOT SMALLER THAN PRONOTALS	5
5.	(4)	PRONOTAL SPINES DISTINCTLY LARGER THAN ANTEOCULAR DENTICLES	6
		PRONOTAL SPINES AT MOST BARELY LARGER THAN ANTEOCULAR DENTICLES	ALLIGATOR
6.	(5)	SUBPOSTPETIOLAR PROCESS PRESENT, ACUTELY DIGITATE	KANANGRA
		SUBPOSTPETIOLAR PROCESS LACKING	ROBUSTUS
7.	(3)	DORSAL PROFILES OF MESOSOMA, PETIOLE AND POSTPETIOLE BROKEN BY NUMEROUS FINE, SHORT, ERECT HAIRS; OCCIPITAL EMARGINATION EXCEPTIONALLY SHALLOW, ITS SIDES ENCLOSING AN ANGLE OF AROUND 100 DEGREES	8
		DORSAL PROFILES OF MESOSOMA, PETIOLE AND POSTPETIOLE BROKEN BY FEW, IF ANY, ERECT HAIRS; OCCIPITAL EMARGINATION NEITHER EXCEPTIONALLY DEEP NOR SHALLOW, ITS SIDES ENCLOSING AN ANGLE WITHIN THE RANGE 50 TO 90 DEGREES	COCCINATUS
8.	(7)	FRONS WITH DENSE, LARGE FOVEAE, AVERAGE SPACING LESS THAN THEIR MEAN DIAMETER	NANUS
		FRONS WITH SCATTERED, WEAKLY IMPRESSED FOVEAE, INTERSPACES STRONGLY SHINING	ROSTRATUS
9.	(2)	APICES OF OCCIPITAL LOBES BROADLY ROUNDED	SZENTIVANYI
		APICES OF OCCIPITAL LOBES EACH DRAWN TO A BLUNT POINT BUT NOT SPINOSE	10
		APICES OF OCCIPITAL LOBES EACH BEARING AN ACUTE SPINE	12
10.	(9)	POSTPETIOLE DISTINCTLY LONGER THAN BROAD IN DORSAL VIEW; FRONS SMOOTH AND SHINING, LACKING FOVEAE	11
		POSTPETIOLE NOT LONGER THAN BROAD IN DORSAL VIEW; FRONS WITH SCATTERED, WEAKLY IMPRESSED FOVEAE, INTERSPACES STRONGLY SHINING	CHYZERI
11.	(10)	HEAD AND MESOSOMA BROWNISH RED, GASTER BROWNISH YELLOW	BIROI

HEAD AND MESOSOMA BLACK OR PICEOUS, GASTER YELLOW..... LONGISPINOSUS

12. (9) FRONS SMOOTH AND SHINING, LACKING FOVEAE; POSTPETIOLE DISTINCTLY LONGER THAN BROAD IN DORSAL VIEW..... HORVATHI
FRONS DENSELY SHAGREENED, OPAQUE, MACROSCULPTURAL FOVEAE FEW, WEAKLY IMPRESSED; POSTPETIOLE NOT LONGER THAN BROAD IN DORSAL VIEW..... VELUTINUS

13. (1) PETIOLAR NODE ROUNDED ABOVE, WITHOUT TRANSVERSE CREST OR DORSOLATERAL ARMAMENT.. 14
PETIOLAR NODE PRISMATIC, WITH TRANSVERSE CREST AND DISTINCT DORSOLATERAL CORNERS..... 15
PETIOLAR NODE DISTINCTLY DORSOLATERALLY BIDENTATE..... 19

14. (13) DORSAL PROFILES OF MESOSOMA, PETIOLE AND POSTPETIOLE BROKEN BY NUMEROUS FINE, SHORT, ERECT HAIRS; FRONS WITH SCATTERED, WEAKLY IMPRESSED FOVEAE, INTERSPACES STRONGLY SHINING; POSTPETIOLE DISTINCTLY LONGER THAN BROAD IN DORSAL VIEW..... SEXSPINOSUS
DORSAL PROFILES OF MESOSOMA, PETIOLE AND POSTPETIOLE BROKEN BY FEW, IF ANY, ERECT HAIRS; FRONS WITH DENSE, LARGE FOVEAE, AVERAGE SPACING LESS THAN THEIR MEAN DIAMETER; POSTPETIOLE NOT LONGER THAN BROAD IN DORSAL VIEW..... ELEGANTULUS

15. (13) ANTEOCULAR DENTICLES PRESENT, DISTINCT, SHARPLY POINTED..... 16
ANTEOCULAR DENTICLES REPRESENTED BY LOW ROUNDED TUMOSITIES, ABOUT AS HIGH AS FRONTAL LOBES..... MJOBERGI
ANTEOCULAR DENTICLES LACKING..... 17

16. (15) BASAL TWO-THIRDS OF INNER MANDIBULAR BORDERS NOT CONCAVE (STRAIGHT, FEEBLY CONVEX OR FEEBLY SINUOUS); DISTINCT SOLDIER CASTE PRESENT ADDITIONAL TO "NORMAL" WORKERS..... VERSICOLOR
BASAL TWO-THIRDS OF INNER MANDIBULAR BORDERS SHALLOWLY BUT DISTINCTLY CONCAVE; DISTINCT SOLDIER CASTE NOT DIFFERENTIATED..... CLARKI

17. (15) EACH INNER MANDIBULAR BORDER, JUST BASAD OF APICAL TEETH, WITH ITS MARGINAL FLANGE FORMING A STRONG TOOTH-LIKE PROCESS, ACUTE TO SUBACUTE AT TIP..... HOWENSIS
EACH INNER MANDIBULAR BORDER, JUST BASAD OF APICAL TEETH, WITH ITS MARGINAL FLANGE EXPANDED AS A ROUNDED PROCESS, NOT TOOTH-LIKE..... 18
EACH INNER MANDIBULAR BORDER, JUST BASAD OF APICAL TEETH, WITHOUT ARMAMENT (MARGINAL FLANGE IF PRESENT FOLLOWING CONTOUR OF JAW, BUT NOT ITSELF EXPANDED)..... DARLINGTONI

18. (17) MAXIMUM HEAD LENGTH LESS THAN 1.3MM; HUMERAL AND ANTERIOR MESONOTAL TUBERCLES RELATIVELY WELL DEVELOPED; DISTRIBUTION NEW CALEDONIA..... SARASINI
MAXIMUM HEAD LENGTH GREATER THAN 1.3MM; HUMERAL AND ANTERIOR MESONOTAL TUBERCLES RELATIVELY POORLY DEVELOPED; DISTRIBUTION NEW ZEALAND (NORTH ISLAND) AND AUSTRALIA..... ANTENNATUS

19. (13) DORSAL PROFILES OF MESOSOMA, PETIOLE AND POSTPETIOLE BROKEN BY NUMEROUS FINE, SHORT, ERECT HAIRS..... 20
DORSAL PROFILES OF MESOSOMA, PETIOLE AND POSTPETIOLE BROKEN BY FEW, IF ANY, ERECT HAIRS..... 22

20. (19) MEDIAN FRONTAL TEETH PRESENT; FRONS WITH DENSE, LARGE FOVEAE, AVERAGE SPACING LESS THAN THEIR MEAN DIAMETER; BASAL TWO-THIRDS OF INNER MANDIBULAR BORDERS NOT CONCAVE (STRAIGHT, FEEBLY CONVEX OR FEEBLY SINUOUS)..... 21
MEDIAN FRONTAL TEETH LACKING; FRONS SMOOTH AND SHINING, LACKING FOVEAE; BASAL TWO-THIRDS OF INNER MANDIBULAR BORDERS SHALLOWLY BUT DISTINCTLY CONCAVE..... PHYLLOBATES

21. (20) POSTPETIOLE DISTINCTLY LONGER THAN BROAD IN DORSAL VIEW; MAXIMUM HEAD LENGTH GREATER THAN 1.3MM; EACH INNER MANDIBULAR BORDER, JUST BASAD OF APICAL TEETH, WITH ITS MARGINAL FLANGE FORMING A STRONG TOOTH-LIKE PROCESS, ACUTE TO SUBACUTE AT TIP..... ECHINUS

POSTPETIOLE NOT LONGER THAN BROAD IN DORSAL VIEW; MAXIMUM HEAD LENGTH LESS THAN 1.3MM; EACH INNER MANDIBULAR BORDER, JUST BASAD OF APICAL TEETH, WITH A MINUTE SUBACUTE ANGLE OR DENTICLE FORMING THE APICAL CORNER OF ITS NARROW MARGINAL FLANGE..... CZIKII

22. (19) FRONS WITH DENSE, LARGE FOVEAE, AVERAGE SPACING LESS THAN THEIR MEAN DIAMETER... SATAN
FRONS WITH SCATTERED, WEAKLY IMPRESSED FOVEAE, INTERSPACES STRONGLY SHINING..... 23
FRONS DENSELY SHAGREENED; OPAQUE, MACROSCULPTURAL FOVEAE FEW, WEAKLY IMPRESSED.. ROOMI

23. (22) APICES OF OCCIPITAL LOBES BROADLY ROUNDED; POSTPETIOLE NOT LONGER THAN BROAD IN DORSAL VIEW; MAXIMUM HEAD LENGTH LESS THAN 1.3MM..... NIGRIVENTRIS
APICES OF OCCIPITAL LOBES EACH BEARING AN ACUTE SPINE; POSTPETIOLE DISTINCTLY LONGER THAN BROAD IN DORSAL VIEW; MAXIMUM HEAD LENGTH GREATER THAN 1.3MM..... HYSTRIX