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## SUPPLEMENTARY REPORT

**Identification of deepwater trawl fish stocks using parasites as markers - gemfish**

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The University of Queensland, and  
Tasmanian Department of Sea Fisheries

Chief Investigator: Dr R.J.G. Lester, Department of Parasitology,  
The University of Queensland, Brisbane Queensland 4072.  
Tel: (07) 365-3305

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*Report prepared by:* R.J.G. Lester and K. B. Sewell,  
Department of Parasitology, The University of Queensland, Brisbane, Queensland 4072.

## **Summary**

The numbers of selected parasite species from 23 samples of gemfish, *Rexea solandri*, from seven locations off southern Australia are given. The data were examined for evidence of isolated gemfish populations. Canonical multivariate analyses of the numbers of larval nematodes (*Anisakis* spp. and *Terranova* sp.), larval cestodes (*Hepatoxylon trichiuri* (Holton, 1802) and *Nybelinia* sp.), acanthocephalans (*Rhadinorhynchus* sp. and *Corynosoma* sp.), and a hemiuroid digenean from a total of 763 gemfish showed that the parasite faunas of fish from eastern Australia were similar except for a sample taken off New South Wales at the end of the spawning season whose affinities are unknown. Fish from South Australia had similar parasite faunas to those collected from eastern Australia suggesting the eastern and western Bass Strait fish belong to the same stock. Samples collected from the Great Australian Bight were distinct from the southern and eastern fish. Differences in parasite fauna were detected between samples taken within the spawning season and those taken from the same locations outside the spawning season, presumably a result of the spawning migration.

## **Background**

Gemfish *Rexea solandri* have supported a fishery along the southeast coast and a smaller one to the west of Bass Strait. Current management procedures accept that gemfish from the south-eastern fishery belong to a single unit stock reliant on a New South Wales spawning area, and that gemfish to the west of Bass Strait belong to a different stock (Kaloila et al. 1993; Lyle & Ford 1993). An artificial tag program to clarify the stock structure has not yet been attempted because gemfish captured in trawl nets and on drop-lines arrive at the surface in poor condition (Rowling 1990).

## **Objectives**

The original objective was to investigate the geographical distributions of several parasites in orange roughy, blue grenadier and gemfish to determine the probable degree of mixing of fish stocks in the southeast trawl fishery.

The final report for the project dealt only with orange roughy (Lester et al., 1988; Sewell & Lester, 1988). This supplementary report describes the gemfish data and analysis. A shortened version was published in Sewell & Lester (1995).

## **Methods**

Twenty-three samples of gemfish were collected by research and commercial trawlers from a total of seven areas off southern Australia (Table 1, Fig. 1). Of the 763 fish examined, 580 were provided by the Tasmanian Department of Sea Fisheries and 183 by the New South Wales Department of Agriculture, Fisheries Division. Each sample came from a different haul. The viscera of the fish were removed, individually frozen in polythene bags with a label giving fish length to caudal fork (LCF) and haul number, then air-freighted to Brisbane and stored frozen. For dissection, the viscera was thawed and the gall bladder fluid

searched using a compound microscope (x400) for a maximum of 5 min to determine the presence or absence of Myxozoa. The remaining viscera was thoroughly searched for helminths by dissection and by examining the tissues squashed between glass plates under a dissecting microscope with transmitted light. Helminths in the lumen of the intestine were not counted because of autolysis and because other studies suggest helminths in the lumen may not be good long term markers for fish (see MacKenzie, 1983; Lester et al. 1985; Lester, 1990). In a few cases the viscera were damaged or incomplete so the counts of some parasites are from a smaller sample size than that given in the table (see Appendix 1).

The term 'prevalence' is used to indicate the number of hosts infected divided by the number of hosts examined, and 'abundance' to indicate the mean number of parasites per host examined in a sample (this includes uninfected hosts) (Margolis et al. 1982).

Summary statistics (abundance and prevalence) were calculated for ten parasite taxa and only prevalences for *Ceratomyxa* sp. The distributions of nine parasites selected as long-term markers were analysed together and in combinations with canonical multivariate analysis (Lester et al. 1985, 1988) to relate the parasite fauna between the seven sample areas. Gemfish samples of less than 15 fish were combined with other samples from the same area (Table 1).

For canonical multivariate analyses, parasite numbers were transformed using  $\log_e(\text{parasite number} + 1)$  to stabilise the variance and to bring the overdispersed frequency distribution closer to normal. The transformed values for each parasite species were adjusted to that of a fish with a LCF equal to the mean LCF of all the fish used in the analysis (62 cm), according to a constant calculated from a regression of  $\log_e(\text{parasite number} + 1)$  on fish length. Uninfected fish were excluded from the regression. This procedure minimised bias introduced as a result of the fish samples having different mean lengths.

A random number between -0.05 and +0.05 was added to all parasite data to allow matrix inversion in the canonical multivariate analysis which was otherwise impossible as some parasite species were absent from some samples. Results of the canonical analyses are displayed as plots of the canonical means for each sample on the first, second, and third canonical axes. Approximate 95% and 99% confidence limits around each point were calculated as circles with radius equal to the square root of 5.99/number of fish in sample and the square root of 9.21/ number of fish in sample, respectively (Mardia et al. 1979).

If gemfish migrate to and from spawning localities, then the parasite fauna of fish taken during the spawning season, which are a mixture of non-resident and resident fish, may differ from that of fish from the same locality taken outside the spawning season. To maximise our chances of detecting differences, we tested statistically the hypothesis that the numbers of parasites found in adult gemfish taken close to the spawning season (June to August) did not differ from the numbers found in adult gemfish taken in the same areas outside the spawning season (December to April). Adult gemfish were defined as fish greater than 55 cm LCF (Rowling and Reid 1992). We had sufficient fish from two areas, the Great Australian Bight (22 v. 127 fish from groups 1a and 1b) and east Tasmania (71 v. 62 fish from groups 4a, 4b, 4c, 5 and 6) for the analysis. The seasonal differences in the average  $\log_e(\text{parasite number} + 1)$  of three common parasites, *Hepatoxylon trichiuri* (Holton, 1802), *Nybelinia* sp., and *Anisakis* sp. type 1 between gemfish were compared using an analysis of that variance which remained after each of a series of five linear models had been fitted to the

data. Model 1 was the total variability about the mean in the 282 fish tested. Unexplained variability was progressively reduced by successive models as follows: model 2 removed simple linear effects of fish length; model 3, average differences between the two areas; model 4, common seasonal differences between areas; and model 5, seasonal differences between areas. Hierarchical and other analyses of variance constructed from the results of these models were used to determine whether there was evidence for the presence of seasonal differences, either as differences common to both areas or differences at a particular area i.e., that variance which remained after models 4 and 5, respectively, were fitted to the data (Lester et al. 1988).

## Results

Eleven taxa of parasites were recognised and counted (Table 2). *Ceratomyxa* sp. was present as spores in the gall bladder fluid. Plerocercoids of *Hepatoxylon trichiuri* were encapsulated in the mesentery, those of *Nybelinia* sp. and degenerate *Nybelinia* sp. were usually found encapsulated in musculature of the stomach wall. Juvenile *Anisakis* spp. were common in the mesentery and were frequently encapsulated in the wall of the gut, especially the stomach. Types were distinguished using the criteria in Smith and Wootten (1978). Juveniles of *Terranova* sp. were found encapsulated in the stomach wall or occasionally the mesentery. The hemiuroid digenean was invariably in a state of degeneration in the mesentery and was usually encapsulated by the host. Easily recognised by its large size (5 to 10 mm) and prominent ventral sucker, it was identified as probably a sclerodistomid or hirudinellid. Unidentifiable cysts of similar size were not found, suggesting that the parasite is able to endure in gemfish in a recognisable form for long periods. *Rhadinorhynchus* sp. was found encapsulated in the mesentery and free in the intestinal lumen. Only *Rhadinorhynchus* from the mesentery were counted and used in the analyses. *Corynosoma* sp. were encapsulated in the mesentery. All but the *Ceratomyxa* were immature forms making species identification speculative. Representative specimens of the nine species of parasites listed in Table 2 are lodged in the Queensland Museum, catalogue numbers QM G211885 to 211896 inclusive.

Parasites were evaluated for their probable longevity in fish and therefore their reliability as host population markers. *Ceratomyxa* sp. was excluded from the analyses because gall bladders were either not intact or not present in all samples and because related species are believed to be short-lived in fish (Lester et al. 1988). Degenerate *Nybelinia* sp. (possibly degenerate forms of intact *Nybelinia* sp.) were small (approx. 0.5 to 1 mm) compared to *Nybelinia* sp. (approx. 2 to 3 mm). Their small size and state of degeneration made identification and accurate counts difficult and time consuming. Significant errors were therefore likely to exist in counts of this parasite and it was also excluded from the analyses.

Nine taxa of parasites were considered suitable for use: the larval cestodes *H. trichiuri* and *Nybelinia* sp.; the larval anisakid nematodes *Anisakis* sp. type 1, *Anisakis* sp. type 2, *Terranova* sp. and degenerate *Anisakis* sp.; the digenean hemiuroid sp., and the acanthocephalans *Rhadinorhynchus* sp. and *Corynosoma* sp. The *Anisakis* type 1 corresponded to the juvenile of *Anisakis simplex* of Hurst (1984); the *Anisakis* type 2 may be *Anisakis physteteris*. Six of the parasites were likely to be long-lived in gemfish as they showed a positive correlation with fish LCF (Table 2). Information on the longevity of parasites related to these and the other three selected parasites in other fish species suggested that all nine were likely to remain recognisable in the fish for an extended time and thus make good stock markers.

Canonical multivariate analysis of data from the nine selected parasite taxa showed that the parasite fauna from areas 2,3,4,5, and 6 (South Australia and east Tasmania) was similar (Figs. 2, 3). Groups 4a, 4b, and 4c, all from the same area (east Tasmania) but taken in different years fell together. Area 3 (South Australia) fell close to all five east coast samples and overlapped with three of them indicating that the parasite faunas showed strong similarities.

The samples from the Great Australian Bight fell together at one side of the figure (Figs. 2,3; groups 1a and 1b). These two samples were taken from the same location but in different seasons and years (Table 1). Both Bight samples fall close to one of the South Australian samples (group 3) and group 1b overlaps with two of the New South Wales samples (groups 7b and 7d) which suggests either some mixing or a common enzootic parasite fauna. Nevertheless, gemfish from the Great Australian Bight (groups 1a and 1b) are distinct from those of South Australia (groups 2 and 3) and Tasmania (groups 4a,b,c, 5, and 6).

The parasite fauna of fish taken off New South Wales at the end of the spawning season (group 7a) is different from most other groups (Fig. 2,3) suggesting that there could be change in the composition of spawning fish between the start and the end of the spawning season.

The first two canonical axes accounted for 67% of the variation. The third axis accounted for a further 11%. To determine the parasite with the greatest discriminating power between areas we ran a simple ANOVA for each parasite and looked for the parasite which had the most significant difference between areas (the greatest  $F$  and the smallest  $p$ ). *Anisakis* sp. type 1 discriminated best, followed by the hemiuroid, *Nybelinia*, *H. trichiuri* and *Terranova* sp. *Anisakis* type 2 had the least discriminating power.

To look for evidence of seasonal movement of mature fish we compared the parasite fauna of large fish caught within the spawning season to that of fish caught in the same area outside the spawning season, for two areas, the Great Australian Bight and east Tasmania. We found that there were significantly different numbers of *H. trichiuri* (Df 1/93;  $F = 4.38$ ;  $p < 0.5$ ), *Nybelinia* sp. (Df 1/91;  $F = 6.43$ ;  $p < 0.05$ ) and *Anisakis* type 1 (Df 1/91;  $F = 18.94$ ;  $p < 0.01$ ) in both areas, indicating that the composition of adult fish caught at these sites during the spawning season was different from that caught there outside the spawning season.

### Implications and recommendations

Our analysis on large fish showed that fish caught at two localities outside the spawning season were different from those caught there during the spawning season. The aberrant group (7a) taken late in the spawning season off New South Wales suggests that the spawning run off New South Wales contained gemfish resident at other times of the year in localities not sampled in the present study. The fish may have been residents of the New South Wales Coast which were later diluted by southern fish in their pre-spawning run, or they may be a component that moves in from offshore. The distinct parasite fauna of group 7a suggests that gemfish from New South Wales do not disperse randomly after spawning.

Rowling (1987) suggested that gemfish in the management area for the South-East Trawl Fishery (the east coast of Australia from Sydney to Tasmania) should be considered as a single stock reliant upon a single spawning area off the northern coast of New South Wales. Our results from the multivariate analysis of parasite fauna support this. However, contrary to current hypotheses regarding stock structure, we demonstrate that there is much similarity between fish off South Australia and the east coast. Thus the parasitological evidence indicates that fish on the eastern and western sides of Bass Strait belong to one stock and fish in the Great Australian Bight belong to another.

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### References

- HURST, R.J. 1984. Identification and description of larval *Anisakis simplex* and *Pseudoterranova decipiens* (Anisakidae: Nematoda) from New Zealand waters. NZ J. Mar. Freshw. Res. 18: 177-186.
- KAILOLA, P.J., M.J. WILLIAMS, P.C. STETWART, R.E. REICHELT, A. McNEE AND C. GRIEVE. 1993. Australian Fisheries Resources. Bureau of Rural Resources, Canberra, pp 338-340.
- KEARNEY, R. 1989. How scientists determine the gemfish TAC. Aust. Fish. 48(5): 20-21.
- LESTER, R. J. G. 1990. Reappraisal of the use of parasites for fish stock identification. Aust. J. Mar. Freshwater Res. 41: 855-864.
- LESTER, R. J. G., A. BARNES, AND G. HABIB. 1985. Parasites of skipjack tuna, *Katsuwonus pelamis*: fishery implications. Fish. Bull. (US) 83: 343-356.
- LESTER, R. J. G., K.B. SEWELL, A. BARNES, AND K. EVANS. 1988. Stock discrimination of orange roughy, *Hoplostethus atlanticus*, by parasite analysis. Mar. Biol. (Berl.) 99: 137-143.
- LYLE, J.M. AND W.B. FORD. 1993. Review of trawl research 1979-1987, with summaries of biological information for the major species. Tasmanian Department of Sea Fisheries, Tech. Rep. 46:1-169.
- MACKENZIE, K. 1983. Parasites as biological tags in fish in population studies. Adv. Appl. Biol. 7: 251-331.

- MARDIA, K. V., J.T. KENT, AND J.M. BIBBY. 1979. Multivariate analysis. Academic Press, New York, NY. 521 p.
- MARGOLIS, L., G.W. ESCH, J.C. HOLMES, A.M. KURIS, AND G.A. SCHAD. 1982. The use of ecological terms in parasitology (report of the *ad hoc* committee of the American Society of Parasitologists). *J. Parasitol.* 68: 131-133.
- ROWLING, K. R. 1987. The need for catch controls in the gemfish industry. *NSW Dep. Agricult. Int. Rep.* 26: 8 p.
- ROWLING, K.R. 1990. Changes in the stock composition and abundance of spawning gemfish, *Rexea solandri* (Cuvier), Gempylidae, in south-eastern Australian waters. *Aust. J. Mar. Freshwater Res.* 41: 145-163.
- ROWLING, K.R, AND D.D. REID. 1992. Effect of temporal changes in size composition on estimates of von Bertalanaffy growth parameters for gemfish *Rexea solandri* (Cuvier), Gempylidae. *Aust. J. Mar. Freshwater Res.* 43: 1229-1239.
- SEWELL, K.B. AND R.J.G. LESTER. 1988. The numbers of selected parasites in Australian and New Zealand samples of orange roughy *Hoplostethus atlanticus*, 1983-86. *Tas. Dept. Sea Fisheries Tech. Rept.* 26, 38 p.
- SEWELL, K.B. AND R.J.G. LESTER. 1995. Stock composition and movement of gemfish, *Rexea solandri*, as indicated by parasites. *Can. J. Fish. Aquat. Sci.* (in press).
- SMITH, J.W. AND R. WOOTTEN. 1978. Anisakis and Anisakiasis. *Adv. Parasitol.* 16: 93-163.

TABLE 1. The origins of the 23 samples of gemfish examined.

Group	Sample number	Capture date	Number in sample	Position
1a	1	10 Nov. 1984	41	33°31'S, 129°30'E
	2	13 Nov. 1984	28	33°28'S, 130°57'E
	3	23 Nov. 1984	53	33°27'S, 126°58'E
	4	23 Nov. 1984	17	33°23'S, 128°03'E
1b	1	1 Jun. 1985	15	33°32'S, 127°09'E
	2	2 Jun. 1985	14	33°32'S, 129°00'E
	3	4 Jun. 1985	15	33°33'S, 131°07'E
2	1	27 Nov. 1984	29	36°04'S, 135°46'E
3	1	2 Nov. 1984	48	37°52'S, 139°47'E
	2	2 Nov. 1984	23	37°11'S, 139°56'E
4a	1	15 Dec. 1984	50	43°38'S, 147°50'E
4b	1	23 Jan. 1985	8	'east of Bruny Island'
	2	9 Jul. 1985	43	43°35'S, 147°57'E
	3	12 Aug. 1985	43	43°35'S, 147°56 E
4c	1	21 Jan. 1986	44	'east of Bruny Island'
5	1	27 Apr. 1985	16	42°40'S, 148°25'E
	2	22 Aug. 1985	29	42°42'S, 148°25'E
	3	8 Apr. 1986	14	42°41'S, 148°24'E
6	1	26 Mar. 1985	50	41°37'S, 148°37'E
7a	1	16 Sep. 1985	29	'off Wollongong'
7b	1	3 Jul. 1984	35	'off Sydney'
7c	1	1 Jul. 1987	63	'off Wollongong'
7d	1	3 Jul. 1987	56	'off Wollongong'

TABLE 2. Abundance and prevalence (%) of selected parasite species found in the viscera of gemfish from the seven areas shown in Figure 1; untransformed data. Overall correlation coefficient ( $r$ ) of  $\log_e(\text{parasite number} + 1)$  to fish caudal fork length (LCF) excludes counts where parasite number equals zero; \* 95% probability, \*\* 99% probability. For raw data see Lester and Sewell (1995). A = abundance, S = standard deviation, R = range, P = prevalence, n.c. = not counted in any fish from this area.

<b>Area</b>		<b>1a</b>	<b>1b</b>	<b>2</b>	<b>3</b>	<b>4a</b>	<b>4b</b>	<b>4c</b>
Average LCF (cm)		55	59	56	69	60	58	63
	S	10	15	8	12	8	6	10
	R	37-90	38-96	42-73	37-96	35-79	41-83	43-86
Number of fish		139	44	29	71	50	94	44
<i>Ceratomyxa</i> sp.P		11%	22%	15%	26%	10%	28%	27%
<i>Hepatoxyylon trichiuri</i>	A	0.17	0.23	0.00	0.28	0.28	0.52	0.30
	S	0.48	0.71	0.00	0.72	0.61	0.86	0.55
	R	0-3	0-4	0	0-4	0-3	0-4	0-2
	P	14%	14%	0%	18%	22%	34%	25%
<i>Nybelinia</i> sp.	A	2.29	8.86	0.55	3.10	2.00	0.52	2.23
	S	4.21	35.95	1.50	5.32	3.10	1.10	3.82
	R	0-37	0-232	0-8	0-26	0-15	0-5	0-17
	P	60%	66%	31%	59%	56%	28%	57%
Degenerate	A	1.67	9.70	0.86	4.33	n.c.	0.61	n.c.
<i>Nybelinia</i> sp.	S	3.52	35.18	1.98	8.25	n.c.	2.00	n.c.
	R	0-25	0-190	0-9	0-38	n.c.	0-13	n.c.
	P	45%	66%	29%	53%	n.c.	23%	n.c.
<i>Anisakis</i> sp.	A	2.56	3.20	0.07	1.94	0.48	0.22	1.02
type 1	S	13.85	8.72	0.26	5.59	1.61	0.76	1.80
	R	0-157	0-50	0-1	0-36	0-10	0-5	0-7
	P	36%	43%	7%	43%	18%	12%	41%
<i>Anisakis</i> sp.	A	0.14	0.52	0.28	0.06	0.18	0.13	0.39
type 2	S	0.56	2.43	1.16	0.23	0.44	0.49	0.87
	R	0-5	0-16	0-6	0-1	0-2	0-3	0-4
	P	10%	16%	7%	6%	16%	9%	23%
Degenerate	A	0.01	0.57	0.00	0.04	0.02	0.01	0.00
<i>Anisakis</i> sp.	S	0.17	3.02	0.00	0.20	0.14	0.10	0.00
	R	0-2	0-20	0-0	0-1	0-1	0-1	0-0
	P	1%	11%	0%	4%	2%	1%	0%
<i>Terranova</i> sp.	A	0.02	7.68	0.03	0.01	0.12	0.00	0.02
	S	0.19	49.72	0.19	0.12	0.39	0.00	0.15
	R	0-2	0-330	0-1	0-1	0-2	0-0	0-1
	P	1%	16%	3%	1%	10%	0%	2%
<i>hemiuroid</i> sp.	A	0.23	0.18	0.00	0.07	0.00	0.03	0.00
	S	0.52	0.58	0.00	0.26	0.00	0.18	0.00
	R	0-2	0-3	0-0	0-1	0-0	0-1	0-0
	P	19%	11%	0%	7%	0%	3%	0%
<i>Rhadinorhynchus</i> sp.	0.07	0.21	0.03	0.01	0.04	0.09	0.09	
	S	0.23	0.46	0.19	0.12	0.20	0.32	0.36
	R	0-1	0-2	0-1	0-1	0-1	0-2	0-2
	7%	18%	3%	1%	4%	7%	7%	
<i>Corynosoma</i> sp.A	0.01	0.02	0.03	0.00	0.00	0.01	0.05	
	S	0.08	0.15	0.19	0.00	0.00	0.10	0.21
	R	0-1	0-1	0-1	0-0	0-0	0-1	0-1
	P	1%	2%	3%	0%	0%	1%	5%

Table 2. (Continued)

<b>Area</b>		<b>5</b>	<b>6</b>	<b>7a</b>	<b>7b</b>	<b>7c</b>	<b>7d</b>	<b><math>\bar{x}</math></b>
Average LCF (cm)		57	50	74	74	69	70	
	S	7	7	12	9	9	7	
	R	47-78	40-67	53-96	60-95	54-107	55-87	
Number of fish		59	50	29	35	63	56	
<i>Ceratomyxa</i> sp.P		9%	10%	33%	14%	n.c.	n.c.	
<i>Hepatoxylon</i> <i>trichiuri</i>	A	0.66	0.42	0.41	0.31	0.68	0.43	0.27**
	S	0.94	0.86	0.91	0.93	1.27	0.81	
	R	0-4	0-5	0-4	0-5	0-8	0-4	
	P	44%	30%	24%	17%	52%	61%	
<i>Nybelinia</i> sp.	A	4.10	1.18	8.66	4.77	2.60	2.09	0.33**
	S	24.27	2.65	15.33	6.69	6.80	2.86	
	R	0-187	0-15	0-81	0-28	0-46	0-11	
	P	46%	40%	76%	69%	52%	61%	
Degenerate	A	0.63	0.34	-	-	2.35	1.70	0.45**
<i>Nybelinia</i> sp.	S	1.13	1.14	-	-	3.90	2.04	
	R	0-5	0-6	-	-	0-18	0-7	
	P	33%	14%	-	-	46%	47%	
<i>Anisakis</i> sp. type 1	A	0.25	0.18	20.76	8.37	9.03	2.46	0.55**
	S	0.71	0.48	54.32	13.71	54.01	3.61	
	R	0-4	0-2	0-269	0-60	0-430	0-18	
	P	17%	16%	79%	69%	56%	63%	
<i>Anisakis</i> sp. type 2	A	0.22	0.14	0.97	0.09	0.33	0.16	0.13
	S	0.72	0.50	3.53	0.28	0.93	0.46	
	R	0-5	0-3	0-19	0-1	0-4	0-2	
	P	15%	10%	28%	9%	16%	13%	
Degenerate	A	0.00	0.00	0.07	0.03	0.13	0.00	0.53*
<i>Anisakis</i> sp.	S	0.00	0.00	0.37	0.17	1.01	0.00	
	R	0-0	0-0	0-2	0-1	0-8	0-0	
	P	0%	0%	3%	3%	2%	0%	
<i>Terranova</i> sp.	A	0.10	0.04	4.07	0.23	0.06	0.21	0.06
	S	0.66	0.20	19.81	0.49	0.40	1.11	
	R	0-5	0-1	0-107	0-2	0-3	0-8	
	P	3%	4%	28%	20%	3%	7%	
Hemiuroid	A	0.00	0.02	0.00	0.00	0.00	0.02	0.25
	S	0.00	0.14	0.00	0.00	0.00	0.13	
	R	0-0	0-1	0-0	0-0	0-0	0-1	
	P	0%	2%	0%	0%	0%	2%	
<i>Rhadinorhynchus</i> sp.	0.12	0.08	0.79	0.31	0.24	0.16	0.60**	
	S	0.42	0.34	1.57	1.1	1.04	0.46	
	R	0-2	0-2	0-6	0-6	0-8	0-2	
	P	8%	6%	28%	11%	13%	13%	
<i>Corynosoma</i> sp.	A	0.02	0.00	0.24	0.00	0.00	0.00	0.08
	S	0.13	0.00	0.95	0.00	0.00	0.00	
	R	0-1	0-0	0-5	0-0	0-0	0-0	
	P	2%	0%	0%	0%	0%	0%	

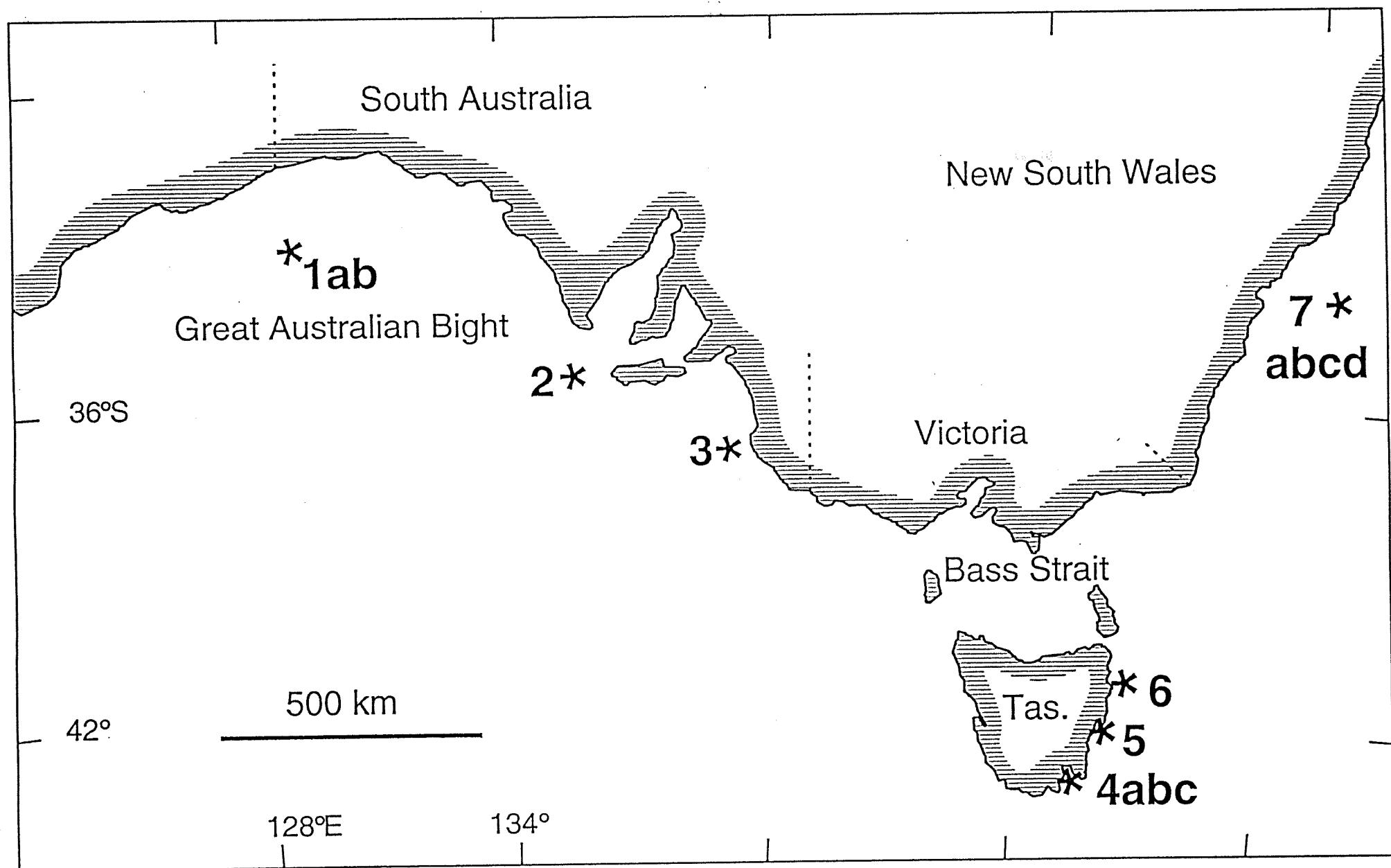
## **Figures**

Fig. 1. Map of southern Australia showing the seven areas (asterisks) from which gemfish samples were taken. Area 1, Great Australian Bight; areas 2 and 3, South Australia; areas 4,5, and 6, east Tasmania, and area 7, New South Wales.

Fig. 2. Canonical multivariate analysis for 13 samples of gemfish (Table 1) from the seven areas shown in Fig. 1. The positions of the sample means on the first and second canonical axes are plotted and their 95% confidence limits shown.

Fig. 3. Plots of the first and third canonical axes of the samples shown in Fig. 2, together with 95% confidence limits.

Fig. 1



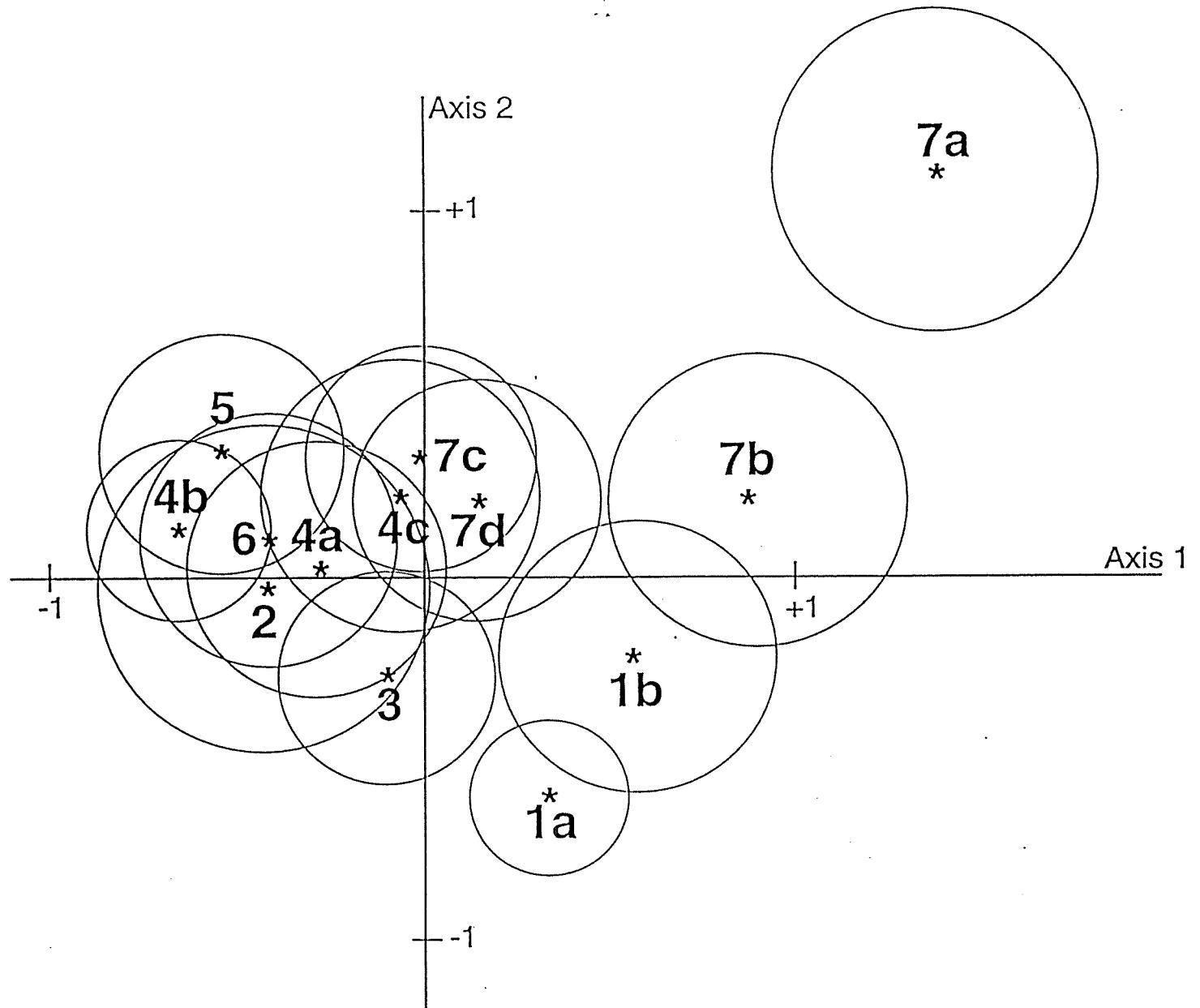


Fig 2

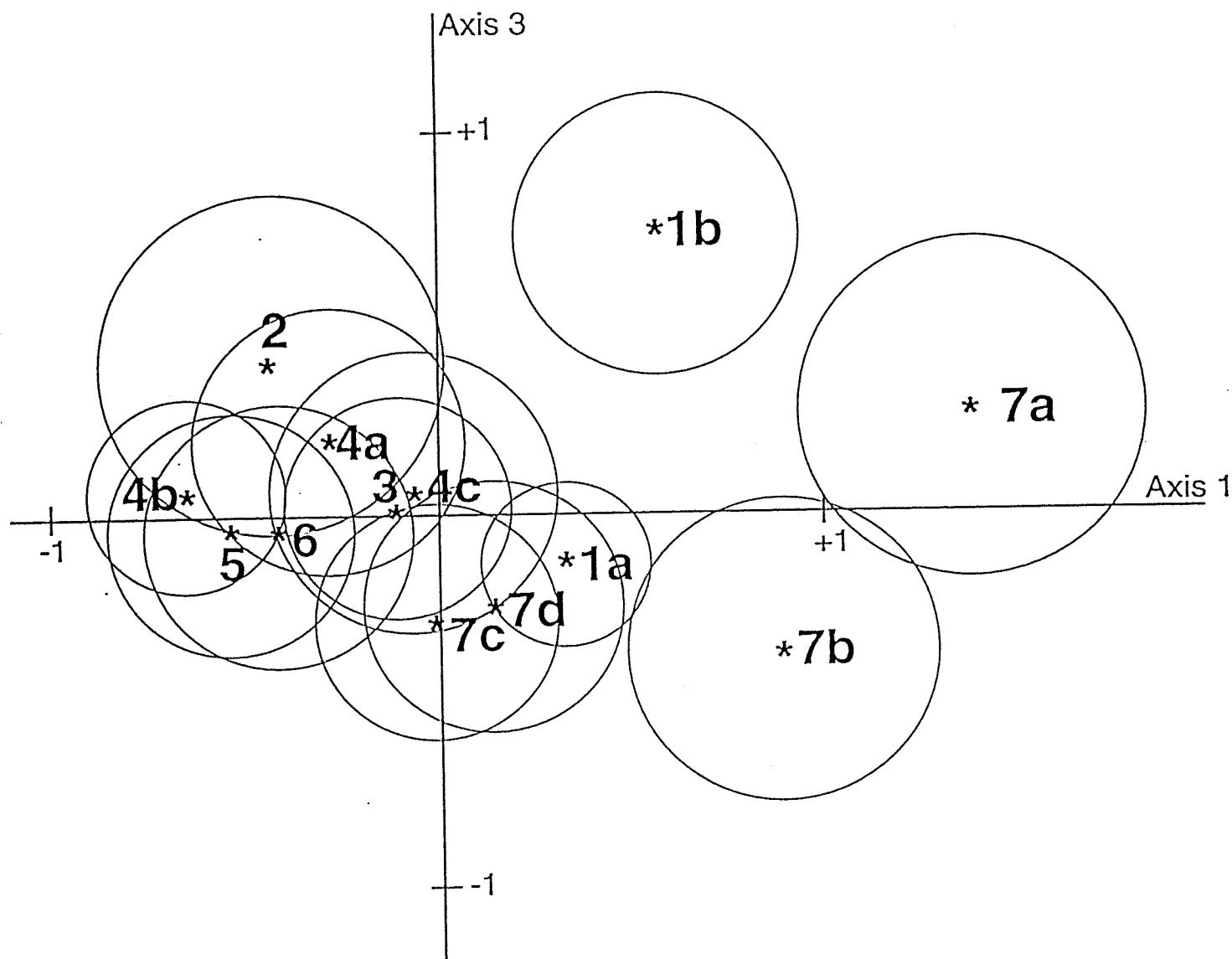


Fig  
3

## APPENDIX 1.

The numbers of selected parasites in 23 samples of gemfish from 7 sites off southern and southeastern Australia. Fish length was measured as length to caudal fork. Asterisks indicate unknown data.

The 17 columns refer to the following:

Column	Item
1	Autopsy number
2	Area (see Figure 1)
3	Area sample number
4	Capture date (DDMMYY)
5	Fish length (LCF cms)
6	<i>Ceratomyxa</i> sp. (1=present, 0=absent)
7	<i>Hepatoxylon trichiuri</i> ) combined for
8	Degenerate <i>H. trichiuri</i> ) the analyses
9	<i>Nybelinia</i> sp.
10	Degenerate <i>Nybelinia</i> sp.
11	<i>Anisakis</i> sp. type 1
12	<i>Anisakis</i> sp. type 2
13	Degenerate <i>Anisakis</i> sp.
14	<i>Terranova</i> sp.
15	Hemiuroid sp.
16	<i>Rhadinorhynchus</i> sp.
17	<i>Corynosoma</i> sp.

	Column number																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
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32	1a	1	101184	52	0	0	0	0	*	0	0	0	0	0	0	0	0
33	1a	1	101184	52	*	0	0	2	*	5	0	0	0	0	0	1	0
34	1a	1	101184	51	0	0	0	0	*	0	0	0	0	0	0	0	0
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39	1a	1	101184	52	0	0	0	0	*	0	0	0	0	0	0	0	0
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628	1a	1	101184	52	*	0	0	0	0	0	1	0	0	0	0	0	0
629	1a	1	101184	48	*	0	0	0	4	0	0	0	0	0	0	0	0
632	1a	1	101184	48	*	0	0	2	0	0	0	0	0	0	0	0	0
637	1a	1	101184	41	*	0	0	0	0	0	1	0	0	0	0	0	0
30	1a	1	101184	37	*	0	0	0	*	0	0	0	0	0	0	0	0
27	1a	1	101184	60	0	0	0	0	*	0	0	0	0	0	0	0	0
28	1a	1	101184	60	0	0	0	0	*	1	0	0	0	0	0	0	0
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290	1a	3	231184	58	0	0	0	0	*	1	0	0	0	0	0	0	0
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522	1a	3	231184	61	0	0	0	1	0	3	0	0	0	0	0	0	0
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434	1a	4	231184	59	0	0	0	6	3	0	0	0	0	0	1	0	0
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443	1a	4	231184	57	0	0	0	1	0	0	0	0	0	0	1	0	0
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236	1b	1	10685	47	0	0	0	5	*	3	1	0	0	1	0	0	0
237	1b	1	10685	48	0	0	0	3	*	0	0	0	0	0	0	0	0
238	1b	1	10685	52	0	0	0	2	*	1	0	0	0	1	0	0	0
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Column numbers																	
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469	1b	3	40685	65	1	0	0	2	2	0	1	1	0	0	1	0	0
470	1b	3	40685	60	*	0	0	1	2	0	0	0	0	0	0	0	0
473	1b	3	40685	58	1	0	0	2	0	0	0	0	0	0	0	0	0
466	1b	3	40685	71	1	0	0	1	8	1	0	1	0	0	0	0	0
467	1b	3	40685	70	0	0	0	2	0	1	1	0	0	0	1	0	0
468	1b	3	40685	82	0	0	1	2	4	0	0	0	0	0	0	0	0
471	1b	3	40685	67	0	0	0	2	1	1	0	0	0	0	0	0	0
472	1b	3	40685	80	1	0	0	0	0	1	0	0	0	0	0	0	0
195	2	1	271184	73	0	0	0	1	0	0	0	0	0	0	0	0	0
203	2	1	271184	71	0	0	0	1	9	0	0	0	0	0	0	0	0
200	2	1	271184	54	0	0	0	0	0	0	0	0	0	0	0	0	0
202	2	1	271184	43	0	0	0	0	0	0	0	0	0	0	0	0	0
204	2	1	271184	49	0	0	0	0	0	0	0	0	0	0	0	0	0
205	2	1	271184	55	0	0	0	1	0	0	0	0	0	0	0	0	0
418	2	1	271184	55	0	0	0	1	1	0	6	0	1	0	0	0	0
419	2	1	271184	44	0	0	0	1	2	0	0	0	0	0	0	0	0
422	2	1	271184	54	0	0	0	1	0	0	0	0	0	0	0	0	0
423	2	1	271184	55	0	0	0	0	0	0	0	0	0	0	0	0	0
424	2	1	271184	42	0	0	0	0	0	0	0	0	0	0	0	0	0
425	2	1	271184	49	0	0	0	0	0	0	0	0	0	0	0	0	0
430	2	1	271184	52	*	0	0	0	0	0	0	0	0	0	0	0	0
431	2	1	271184	44	0	0	0	0	0	0	0	0	0	0	0	0	0
201	2	1	271184	56	0	0	0	1	2	0	0	0	0	0	0	0	0
206	2	1	271184	61	1	0	0	0	0	0	0	0	0	0	0	0	0
207	2	1	271184	59	0	0	0	0	0	0	0	0	0	0	0	1	0
208	2	1	271184	61	*	0	0	0	0	0	0	0	0	0	0	0	0
209	2	1	271184	66	0	0	0	0	5	0	0	0	0	0	0	0	0
210	2	1	271184	61	0	0	0	0	0	0	0	0	0	0	0	0	0
420	2	1	271184	58	1	0	0	1	0	0	0	0	0	0	0	0	0
421	2	1	271184	58	1	0	0	0	0	0	0	0	0	0	0	0	0
426	2	1	271184	64	0	0	0	8	1	0	0	0	0	0	0	0	0
427	2	1	271184	60	0	0	0	0	1	0	0	0	0	0	0	0	0
428	2	1	271184	59	1	0	0	0	0	1	2	0	0	0	0	0	0
429	2	1	271184	58	0	0	0	0	0	1	0	0	0	0	0	0	0
192	2	1	271184	56	0	0	0	0	*	0	0	0	0	0	0	0	1
193	2	1	271184	59	0	0	0	0	3	0	0	0	0	0	0	0	0
194	2	1	271184	56	0	0	0	0	0	0	0	0	0	0	0	0	0
485	3	1	21184	37	0	0	0	0	0	0	0	0	0	0	0	0	0
497	3	1	21184	40	0	0	0	0	0	0	0	0	0	0	0	0	0
350	3	1	21184	60	0	0	0	0	0	0	0	0	0	0	1	0	0
353	3	1	21184	62	0	0	0	1	0	0	0	0	0	0	0	0	0

Column number																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
354	3	1	21184	64	0	0	0	0	4	0	0	0	0	0	0	0	0
356	3	1	21184	58	1	0	0	0	0	0	0	0	0	0	0	0	0
358	3	1	21184	58	0	0	0	4	3	4	0	0	0	0	0	0	0
359	3	1	21184	57	0	0	0	0	1	0	0	0	0	0	0	0	0
361	3	1	21184	56	0	1	0	3	2	0	0	0	0	0	0	0	0
108	3	1	21184	61	1	0	0	0	*	1	0	0	0	0	0	0	0
474	3	1	21184	63	1	0	0	0	2	1	0	0	0	0	0	0	0
481	3	1	21184	61	0	0	0	3	0	0	0	0	0	0	0	0	0
483	3	1	21184	65	0	0	0	0	5	0	0	0	0	0	1	0	0
484	3	1	21184	61	0	0	0	1	0	0	0	0	0	0	0	0	0
495	3	1	21184	63	0	0	0	0	0	0	0	0	0	0	0	0	0
109	3	1	21184	78	0	0	0	0	*	0	0	0	0	0	0	0	0
110	3	1	21184	73	0	0	0	11	*	1	0	0	0	0	0	0	0
111	3	1	21184	80	0	0	0	0	*	1	0	0	0	0	0	0	0
112	3	1	21184	69	0	0	0	1	*	0	0	0	0	0	0	0	0
113	3	1	21184	66	0	0	0	0	*	0	0	0	0	0	0	0	0
114	3	1	21184	78	0	0	1	5	*	0	0	0	0	0	0	0	0
115	3	1	21184	66	0	0	0	3	*	0	0	0	0	0	0	0	0
116	3	1	21184	75	0	0	1	0	*	0	0	0	0	0	0	0	0
117	3	1	21184	69	1	0	0	1	*	0	0	0	0	0	0	0	0
118	3	1	21184	72	0	0	0	4	*	1	0	0	0	1	0	0	0
475	3	1	21184	73	1	0	0	7	7	1	0	0	0	0	0	0	0
476	3	1	21184	66	0	0	0	0	0	0	0	0	0	0	0	0	0
477	3	1	21184	78	1	0	0	6	7	1	0	0	0	0	1	0	0
478	3	1	21184	78	0	0	0	4	23	1	0	0	0	0	0	0	0
479	3	1	21184	69	0	0	1	23	6	0	1	0	0	0	0	0	0
480	3	1	21184	86	1	0	0	2	0	7	0	0	0	0	0	0	0
482	3	1	21184	82	1	0	0	0	3	3	0	0	0	0	0	0	0
486	3	1	21184	73	0	0	3	1	7	0	0	0	0	0	0	0	0
487	3	1	21184	76	1	0	0	3	0	0	0	0	0	0	0	0	0
488	3	1	21184	69	0	0	2	0	0	1	0	0	0	0	0	0	0
489	3	1	21184	68	1	0	0	20	3	0	0	0	0	0	0	0	0
490	3	1	21184	76	0	0	0	3	1	3	0	0	0	0	0	0	0
491	3	1	21184	73	0	0	0	1	0	0	0	0	0	0	0	0	0
492	3	1	21184	72	0	0	0	0	0	1	0	0	0	0	0	0	0
493	3	1	21184	77	0	0	4	3	38	0	0	0	0	0	0	0	0
494	3	1	21184	85	0	0	1	6	38	2	0	0	0	0	0	0	0
496	3	1	21184	71	1	0	2	1	18	2	0	0	0	0	0	0	0
498	3	1	21184	76	1	0	1	1	4	6	0	0	0	0	0	0	0
501	3	1	21184	86	0	0	0	1	13	6	0	0	0	0	0	0	0
502	3	1	21184	79	0	0	0	5	9	1	0	0	0	0	0	0	0
499	3	1	21184	96	0	1	0	0	0	36	1	1	0	0	0	0	0
500	3	1	21184	93	0	0	0	6	2	6	0	1	0	0	0	0	0
502	3	1	21184	79	0	0	0	5	9	1	0	0	0	0	0	0	0
351	3	2	21184	53	0	0	0	2	0	0	0	0	0	0	0	0	0
600	3	2	21184	53	*	0	0	0	0	0	0	0	0	0	0	0	0
603	3	2	21184	51	0	0	0	0	0	0	0	0	0	0	0	0	0
607	3	2	21184	52	0	0	0	0	0	0	0	0	0	0	0	0	0
594	3	2	21184	49	*	0	0	0	0	0	0	0	0	0	0	0	0
595	3	2	21184	65	0	0	0	0	0	0	0	0	0	0	1	0	0
596	3	2	21184	61	0	0	0	26	2	0	0	0	0	0	1	0	0
597	3	2	21184	56	1	0	0	1	0	0	0	0	0	0	1	0	0
598	3	2	21184	64	0	0	0	1	3	0	0	0	0	0	0	0	0
599	3	2	21184	58	0	0	0	0	0	0	1	0	0	0	1	0	0

	Column numbers																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
605	3	2	21184	58	0	0	0	0	0	0	0	0	0	0	0	0	0
606	3	2	21184	62	0	0	0	16	3	0	0	0	0	0	0	0	0
601	3	2	21184	73	*	0	0	0	0	0	0	0	0	0	0	0	0
602	3	2	21184	81	0	0	0	0	1	16	0	0	0	0	0	0	0
604	3	2	21184	72	0	0	0	2	2	1	0	1	0	0	0	0	0
608	3	2	21184	84	0	0	0	0	0	0	0	0	0	0	0	0	0
609	3	2	21184	82	1	0	0	1	4	3	0	0	0	0	0	0	0
610	3	2	21184	74	1	0	0	2	1	0	0	0	0	0	0	0	0
611	3	2	21184	82	0	0	0	1	1	1	1	0	0	0	0	0	0
352	3	2	21184	74	1	0	1	12	0	1	0	0	0	0	0	0	0
360	3	2	21184	82	1	0	1	11	22	26	0	0	0	0	0	0	0
355	3	2	21184	77	0	0	0	5	0	0	1	0	0	0	0	0	0
357	3	2	21184	67	1	0	0	5	16	2	0	0	0	0	0	0	0
42	4a	1	151284	53	0	0	0	0	*	0	0	0	0	0	0	0	0
49	4a	1	151284	51	0	1	0	0	*	0	1	0	0	0	0	0	0
52	4a	1	151284	55	0	0	0	10	*	0	0	0	0	0	0	0	0
54	4a	1	151284	52	0	1	0	0	*	0	0	0	0	0	0	0	0
57	4a	1	151284	51	0	0	0	0	*	0	0	0	0	0	0	0	0
59	4a	1	151284	52	0	0	0	1	*	0	0	0	0	0	0	0	0
60	4a	1	151284	35	0	0	0	0	*	0	0	0	0	0	0	0	0
62	4a	1	151284	47	0	0	0	4	*	0	0	0	0	0	0	0	0
68	4a	1	151284	52	0	0	0	0	*	0	1	0	0	0	0	0	0
71	4a	1	151284	54	0	0	0	1	*	0	0	0	0	0	0	0	0
72	4a	1	151284	52	0	0	0	0	*	0	0	0	0	0	0	0	0
81	4a	1	151284	54	1	0	1	2	*	0	1	0	0	0	0	0	0
85	4a	1	151284	52	0	0	0	0	*	0	0	0	0	0	0	0	0
41	4a	1	151284	61	0	0	0	0	*	0	0	0	0	0	0	0	0
43	4a	1	151284	57	0	0	0	2	*	0	0	0	0	2	0	0	0
44	4a	1	151284	56	0	0	1	0	*	0	0	0	0	0	0	0	0
45	4a	1	151284	59	0	0	0	0	*	0	0	0	0	0	0	0	0
46	4a	1	151284	57	0	0	0	1	*	0	0	0	0	0	0	0	0
47	4a	1	151284	60	0	0	0	1	*	0	0	0	0	0	0	0	0
48	4a	1	151284	64	0	0	0	3	*	0	0	0	0	0	0	0	0
50	4a	1	151284	58	0	0	0	0	*	0	0	0	0	0	0	0	0
51	4a	1	151284	62	0	0	0	2	*	0	0	0	0	0	0	0	0
53	4a	1	151284	60	0	1	1	1	*	0	1	0	0	0	0	0	0
55	4a	1	151284	59	0	0	1	0	*	0	0	0	0	0	0	0	0
56	4a	1	151284	63	1	0	0	1	*	0	0	0	0	0	0	0	0
58	4a	1	151284	69	0	0	0	3	*	0	0	0	0	0	0	0	0
61	4a	1	151284	62	0	0	0	1	*	0	0	0	0	0	0	0	0
63	4a	1	151284	64	1	0	0	0	*	0	0	0	0	0	0	0	0
64	4a	1	151284	60	0	0	0	5	*	1	1	0	0	0	0	0	0
65	4a	1	151284	59	0	0	0	2	*	0	0	0	1	0	0	0	0
66	4a	1	151284	57	0	0	0	0	*	0	0	0	0	0	0	0	0
67	4a	1	151284	62	0	0	0	0	*	1	0	0	1	0	0	0	0
69	4a	1	151284	58	0	0	0	1	*	0	0	1	0	0	0	0	0
74	4a	1	151284	58	0	0	0	0	*	1	0	0	0	0	0	0	0
75	4a	1	151284	61	0	0	0	4	*	0	0	0	0	0	0	0	0
77	4a	1	151284	64	0	0	0	0	*	1	0	0	0	0	0	0	0
78	4a	1	151284	65	0	0	0	7	*	0	0	0	0	0	0	0	0
79	4a	1	151284	59	0	0	0	0	*	0	0	0	0	0	0	0	0
80	4a	1	151284	59	1	0	0	15	*	0	0	0	0	0	1	0	0
83	4a	1	151284	59	0	0	0	1	*	0	0	0	0	0	0	0	0
84	4a	1	151284	63	0	0	0	9	*	0	0	0	0	0	0	0	0

																	Column number
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
87	4a	1	151284	59	0	0	0	2	*	2	1	0	0	0	0	0	
89	4a	1	151284	65	0	0	1	2	*	0	0	0	0	0	0	0	
58	4a	1	151284	69	0	0	0	3	*	0	0	0	0	0	0	0	
70	4a	1	151284	76	0	0	0	8	*	2	0	0	0	0	0	0	
73	4a	1	151284	74	*	0	0	5	*	0	2	0	0	0	0	0	
76	4a	1	151284	66	0	0	1	0	*	0	1	0	1	0	0	0	
82	4a	1	151284	79	0	0	1	0	*	5	0	0	0	0	0	0	
86	4a	1	151284	75	1	1	2	3	*	10	0	0	1	0	1	0	
88	4a	1	151284	72	*	0	1	0	*	1	0	0	0	0	0	0	
140	4b	1	230185	67	0	0	1	4	*	3	0	0	0	0	1	0	
142	4b	1	230185	66	0	0	0	0	*	0	0	0	0	0	0	0	
146	4b	1	230185	69	0	0	3	0	*	0	3	0	0	0	0	0	
147	4b	1	230185	70	0	0	2	4	*	1	0	0	0	0	1	0	
141	4b	1	230185	65	0	0	0	0	*	1	0	0	0	0	0	0	
143	4b	1	230185	59	0	0	1	0	*	0	0	0	0	0	0	0	
144	4b	1	230185	59	0	0	0	1	*	0	0	0	0	0	0	0	
145	4b	1	230185	60	0	0	0	0	*	0	0	0	0	0	0	0	
362	4b	2	90785	51	0	0	0	0	0	0	0	0	0	0	0	0	
365	4b	2	90785	50	0	0	0	0	0	0	0	0	0	0	0	0	
370	4b	2	90785	51	0	0	2	2	0	0	0	0	0	0	0	0	
374	4b	2	90785	41	0	0	0	0	0	0	0	0	0	0	0	0	
382	4b	2	90785	52	0	0	1	0	0	0	0	0	0	0	0	0	
387	4b	2	90785	55	1	0	0	0	0	0	0	0	0	0	0	0	
390	4b	2	90785	51	0	0	0	0	0	0	0	0	0	0	0	0	
395	4b	2	90785	52	0	0	1	0	0	1	0	0	0	0	0	0	
401	4b	2	90785	53	1	0	0	0	0	0	0	0	0	0	0	0	
404	4b	2	90785	47	*	0	1	1	4	0	0	0	0	0	0	0	
363	4b	2	90785	61	0	0	0	0	0	0	0	0	0	0	0	0	
364	4b	2	90785	58	*	0	0	1	1	0	0	0	0	0	0	0	
366	4b	2	90785	58	0	0	0	0	0	1	0	0	0	0	0	0	
367	4b	2	90785	59	0	0	1	0	0	0	0	0	0	0	0	0	
368	4b	2	90785	56	*	0	0	0	0	0	0	0	0	0	1	0	
369	4b	2	90785	60	1	0	0	1	0	0	0	0	0	0	1	0	
371	4b	2	90785	60	1	1	0	0	0	0	0	3	0	0	0	0	
373	4b	2	90785	56	0	0	2	0	0	0	0	0	0	0	0	0	
376	4b	2	90785	64	0	2	0	1	0	0	0	1	1	0	0	0	
381	4b	2	90785	61	0	0	0	0	1	0	0	0	0	0	0	0	
383	4b	2	90785	57	0	0	0	0	0	0	0	0	0	0	0	0	
384	4b	2	90785	57	0	0	0	0	0	0	0	0	0	0	0	0	
385	4b	2	90785	56	1	0	0	0	0	0	0	0	0	0	0	0	
386	4b	2	90785	57	0	0	0	0	0	0	0	0	0	0	0	0	
389	4b	2	90785	56	0	0	1	0	1	0	0	0	0	0	0	0	
391	4b	2	90785	57	0	0	0	1	0	0	0	0	0	0	0	0	
392	4b	2	90785	62	1	0	0	0	0	0	0	0	0	0	0	0	
393	4b	2	90785	58	1	0	0	0	0	0	0	0	0	0	0	0	
394	4b	2	90785	62	0	0	1	0	0	0	0	0	0	0	0	0	
396	4b	2	90785	60	0	0	0	1	0	0	0	0	0	0	0	0	
397	4b	2	90785	62	0	0	0	1	0	0	0	0	0	0	0	2	
398	4b	2	90785	60	1	0	0	0	0	0	1	0	0	0	0	0	
399	4b	2	90785	56	0	0	0	0	0	0	0	1	0	0	0	0	
402	4b	2	90785	65	1	0	0	0	0	0	0	0	0	0	0	1	
403	4b	2	90785	59	0	0	0	0	0	5	0	0	0	0	0	0	
372	4b	2	90785	69	0	1	1	0	0	0	0	0	0	0	0	0	
375	4b	2	90785	83	0	0	1	5	12	3	0	0	0	0	0	0	

Column numbers																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
377	4b	2	90785	71	1	0	0	0	0	1	0	0	0	0	0	0	0
378	4b	2	90785	66	0	0	0	2	0	0	0	0	0	0	0	0	0
379	4b	2	90785	68	0	0	0	0	0	1	0	0	0	0	0	0	0
380	4b	2	90785	73	0	0	0	1	0	0	0	0	0	0	0	0	0
388	4b	2	90785	74	0	0	1	0	0	3	0	0	0	0	0	1	0
400	4b	2	90785	67	1	0	1	0	0	0	0	0	0	0	0	0	0
211	4b	3	120885	53	0	0	0	0	1	0	0	0	0	0	0	0	0
212	4b	3	120885	55	1	0	0	0	0	0	0	0	0	0	1	0	0
213	4b	3	120885	55	0	1	1	0	0	0	0	0	0	0	0	0	0
214	4b	3	120885	55	0	0	0	0	0	0	1	0	0	0	0	0	0
216	4b	3	120885	55	1	0	0	0	0	0	1	0	0	0	0	0	0
218	4b	3	120885	55	0	0	0	0	0	0	0	0	0	0	0	0	0
222	4b	3	120885	53	0	0	0	0	1	0	0	0	0	0	0	0	0
225	4b	3	120885	52	0	0	0	1	0	0	0	0	0	0	1	0	0
227	4b	3	120885	53	1	0	0	0	0	0	0	0	0	0	0	0	0
228	4b	3	120885	54	0	0	0	1	0	0	0	0	0	0	0	0	0
229	4b	3	120885	54	0	1	2	0	0	0	0	0	0	0	0	0	0
231	4b	3	120885	54	0	0	0	1	0	0	0	0	0	0	0	0	0
542	4b	3	120885	51	0	0	0	0	0	0	0	0	0	0	0	0	0
543	4b	3	120885	55	1	0	1	1	0	0	0	0	0	0	0	0	0
544	4b	3	120885	52	1	0	0	1	0	0	0	0	0	0	0	0	0
545	4b	3	120885	51	0	0	0	0	0	0	0	0	0	0	0	0	0
546	4b	3	120885	53	0	0	0	3	4	0	0	0	0	0	0	0	0
548	4b	3	120885	50	1	1	0	0	1	0	0	0	0	0	0	0	0
549	4b	3	120885	52	0	0	0	5	0	0	0	0	0	0	0	0	0
551	4b	3	120885	55	*	0	0	1	1	0	0	0	0	0	0	0	0
553	4b	3	120885	53	0	0	0	0	0	0	0	0	0	0	0	0	0
554	4b	3	120885	51	1	0	0	0	1	0	0	0	0	0	0	0	0
555	4b	3	120885	53	0	0	4	0	0	0	0	0	0	0	0	0	0
556	4b	3	120885	54	*	0	1	0	0	0	0	0	0	0	0	0	0
559	4b	3	120885	51	0	0	0	0	0	0	0	0	0	0	0	0	0
560	4b	3	120885	54	*	0	0	0	0	1	0	0	0	0	0	0	0
562	4b	3	120885	55	0	0	0	4	13	0	0	0	0	0	0	0	0
215	4b	3	120885	63	1	1	0	0	1	0	0	0	0	0	0	0	0
217	4b	3	120885	57	0	1	1	0	0	0	1	0	0	0	0	0	0
219	4b	3	120885	57	1	0	2	0	0	0	0	0	0	0	0	0	0
220	4b	3	120885	62	0	0	0	2	0	0	0	0	0	0	0	1	0
221	4b	3	120885	60	0	0	0	2	1	0	0	0	0	0	0	0	0
223	4b	3	120885	58	1	0	1	0	0	0	0	0	0	0	0	0	0
226	4b	3	120885	59	0	0	0	0	0	1	0	0	0	0	0	0	0
230	4b	3	120885	64	0	0	0	1	2	0	0	0	0	0	0	0	0
547	4b	3	120885	60	*	0	0	0	1	0	0	0	0	0	0	0	0
550	4b	3	120885	62	1	0	0	0	2	0	0	0	0	1	0	0	0
552	4b	3	120885	58	0	0	3	0	0	0	0	0	0	0	0	0	0
557	4b	3	120885	57	*	0	0	0	0	0	0	0	0	0	0	0	0
558	4b	3	120885	60	0	0	1	0	0	0	0	0	0	0	0	0	0
561	4b	3	120885	63	1	0	1	0	2	0	1	0	0	0	0	0	0
563	4b	3	120885	57	0	0	0	0	0	0	0	0	0	0	0	0	0
224	4b	3	120885	67	1	0	1	0	0	0	0	0	0	0	0	0	0
155	4c	1	210186	50	1	0	0	0	*	0	0	0	0	0	0	0	0
156	4c	1	210186	52	1	0	0	1	*	0	0	0	0	0	0	0	0
162	4c	1	210186	43	1	0	0	0	*	0	0	0	0	0	0	0	0
164	4c	1	210186	43	1	0	0	2	*	0	1	0	0	0	0	0	0
166	4c	1	210186	44	0	0	0	0	*	0	0	0	0	0	0	0	0

																		Column number
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
167	4c	1	210186	45	0	0	0	0	*	0	0	0	0	0	0	0	0	
168	4c	1	210186	54	0	0	0	0	*	0	0	0	0	0	0	0	0	
175	4c	1	210186	44	1	0	0	0	*	0	1	0	0	0	0	0	0	
148	4c	1	210186	61	0	0	0	1	*	1	0	0	0	0	0	0	0	
151	4c	1	210186	60	0	0	0	3	*	0	0	0	0	0	0	0	0	
152	4c	1	210186	64	1	0	0	0	*	1	0	0	0	0	0	0	0	
159	4c	1	210186	61	0	0	0	1	*	0	1	0	0	0	0	0	0	
161	4c	1	210186	56	0	0	1	1	*	0	0	0	0	0	0	0	1	
171	4c	1	210186	58	0	0	1	0	*	0	0	0	0	0	0	0	0	
174	4c	1	210186	65	0	0	0	0	*	3	1	0	0	0	0	0	0	
178	4c	1	210186	61	0	0	1	3	*	1	0	0	0	0	0	0	0	
179	4c	1	210186	63	1	0	0	2	*	0	0	0	0	0	0	0	0	
180	4c	1	210186	60	1	0	0	1	*	0	0	0	0	0	0	0	0	
183	4c	1	210186	56	0	0	0	0	*	0	0	0	0	0	0	0	0	
185	4c	1	210186	57	0	0	1	0	*	0	0	0	0	0	0	0	0	
187	4c	1	210186	60	0	0	1	0	*	0	0	0	0	0	0	0	0	
190	4c	1	210186	65	0	0	2	0	*	0	1	0	0	0	0	0	0	
149	4c	1	210186	72	1	0	0	0	*	0	0	0	0	0	0	0	0	
150	4c	1	210186	67	0	0	0	0	*	0	1	0	0	0	0	0	0	
153	4c	1	210186	66	0	0	0	3	*	1	0	0	0	0	0	0	0	
154	4c	1	210186	67	0	0	0	5	*	1	0	0	0	0	0	0	0	
157	4c	1	210186	66	0	0	0	2	*	0	0	0	0	0	0	0	0	
158	4c	1	210186	76	1	0	0	16	*	6	0	0	0	0	0	0	0	
160	4c	1	210186	69	0	0	0	3	*	1	2	0	0	0	0	0	0	
163	4c	1	210186	68	0	0	0	0	*	7	3	0	0	0	0	0	0	
165	4c	1	210186	86	0	0	2	17	*	1	0	0	0	0	0	0	0	
169	4c	1	210186	67	0	0	0	1	*	0	0	0	0	0	2	0	0	
170	4c	1	210186	69	0	0	0	11	*	0	0	0	0	1	0	0	0	
172	4c	1	210186	66	0	0	0	2	*	0	4	0	0	0	0	0	0	
173	4c	1	210186	71	0	0	1	0	*	3	0	0	0	0	0	0	0	
176	4c	1	210186	66	1	0	0	1	*	1	0	0	0	0	0	0	0	
177	4c	1	210186	67	0	0	1	1	*	2	0	0	0	0	0	0	0	
181	4c	1	210186	68	0	0	0	2	*	6	0	0	0	0	0	0	0	
182	4c	1	210186	68	0	0	0	5	*	2	0	0	0	0	0	0	1	
184	4c	1	210186	71	0	0	0	5	*	2	0	0	0	0	0	0	0	
186	4c	1	210186	74	1	0	1	4	*	5	0	0	0	0	1	0	0	
188	4c	1	210186	70	0	0	0	5	*	1	2	0	0	0	1	0	0	
189	4c	1	210186	71	0	0	1	0	*	0	0	0	0	0	0	0	0	
191	4c	1	210186	72	0	0	0	0	*	0	0	0	0	0	0	0	0	
261	5	1	270485	62	0	0	0	0	*	0	0	0	0	0	0	0	0	
262	5	1	270485	63	0	1	1	0	*	0	0	0	0	0	0	0	0	
263	5	1	270485	62	1	0	3	1	*	1	0	0	0	0	0	0	0	
264	5	1	270485	60	0	0	2	4	*	0	1	0	0	0	0	0	0	
266	5	1	270485	63	1	0	0	0	*	0	0	0	0	0	1	0	0	
267	5	1	270485	55	0	0	1	0	*	0	1	0	0	0	0	0	0	
268	5	1	270485	65	0	0	2	1	*	1	0	0	0	0	0	0	0	
269	5	1	270485	62	0	0	0	2	*	1	0	0	0	0	0	0	0	
270	5	1	270485	56	0	0	0	1	*	0	0	0	0	0	0	0	0	
272	5	1	270485	65	0	0	1	0	*	0	0	0	0	0	0	0	0	
273	5	1	270485	63	0	0	0	0	*	0	0	0	0	0	0	0	0	
274	5	1	270485	62	0	0	3	0	*	0	0	0	0	0	0	0	0	
275	5	1	270485	57	0	1	1	1	*	0	0	0	0	0	0	0	0	
276	5	1	270485	65	1	0	0	1	*	0	0	0	0	0	0	0	0	
265	5	1	270485	71	0	1	0	0	*	1	0	0	0	0	0	1	0	

Column numbers																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
271	5	1	270485	55	0	0	0	2	*	0	0	0	0	0	0	0
564	5	2	220885	51	0	0	0	8	0	0	0	0	0	0	0	0
565	5	2	220885	51	0	1	0	2	2	0	0	0	0	0	0	0
566	5	2	220885	54	0	0	0	1	0	0	0	0	0	0	0	0
567	5	2	220885	54	1	0	1	0	0	0	0	0	0	0	0	0
569	5	2	220885	50	*	0	0	0	0	0	0	0	0	0	0	0
570	5	2	220885	49	0	0	0	0	0	0	0	0	0	0	0	0
571	5	2	220885	51	*	0	0	1	0	0	0	0	0	0	0	0
572	5	2	220885	47	0	0	0	0	0	0	0	0	0	0	0	0
573	5	2	220885	47	0	0	0	0	0	0	0	0	0	0	0	0
574	5	2	220885	49	0	0	0	0	0	0	0	0	0	0	0	0
575	5	2	220885	49	*	0	0	2	0	0	0	0	0	0	0	0
576	5	2	220885	51	*	0	0	0	0	0	0	0	0	0	0	0
577	5	2	220885	51	0	0	0	0	2	0	0	0	0	0	0	0
578	5	2	220885	50	0	0	0	1	1	0	0	0	0	0	0	0
579	5	2	220885	54	0	0	0	0	0	0	0	0	0	0	0	0
580	5	2	220885	51	0	1	0	1	1	0	0	0	0	0	0	0
581	5	2	220885	53	*	0	0	0	0	0	0	0	0	0	0	0
583	5	2	220885	52	1	0	0	0	0	0	0	0	0	0	0	0
584	5	2	220885	50	0	0	0	0	0	0	0	0	0	0	0	0
585	5	2	220885	49	0	0	0	0	0	0	1	0	0	0	0	0
587	5	2	220885	55	0	0	0	0	0	0	0	0	0	0	0	0
588	5	2	220885	52	*	1	0	0	1	0	0	0	0	0	0	1
589	5	2	220885	51	0	0	0	1	0	0	0	0	0	0	0	0
591	5	2	220885	49	0	0	0	1	1	0	0	0	0	0	0	0
592	5	2	220885	48	0	1	0	0	0	0	0	1	0	0	0	0
593	5	2	220885	52	0	0	1	0	0	0	0	0	0	0	0	0
568	5	2	220885	59	0	0	0	2	0	0	1	0	0	0	0	0
582	5	2	220885	57	0	0	0	0	0	0	0	0	0	0	0	0
590	5	2	220885	60	0	0	1	0	0	0	0	0	0	0	0	0
250	5	3	80486	60	0	0	1	1	0	0	0	1	0	0	0	1
252	5	3	80486	65	0	0	1	2	0	0	0	0	0	0	0	0
253	5	3	80486	58	0	0	4	0	1	0	0	0	0	0	0	0
255	5	3	80486	58	0	0	1	0	3	0	1	0	0	0	0	0
257	5	3	80486	64	0	0	0	0	0	1	0	0	1	0	0	0
258	5	3	80486	60	0	0	1	5	0	0	0	0	0	0	0	0
259	5	3	80486	60	0	0	0	1	2	0	0	0	0	0	0	0
260	5	3	80486	66	0	0	1	4	5	0	0	0	0	0	0	0
247	5	3	80486	71	0	0	3	0	3	0	5	0	0	0	0	0
248	5	3	80486	77	0	0	0	187	0	4	0	0	5	0	0	0
249	5	3	80486	78	0	0	0	2	1	1	1	0	0	0	2	0
251	5	3	80486	67	0	0	1	3	1	3	1	0	0	0	2	0
255	5	3	80486	58	0	0	1	0	3	0	1	0	0	0	0	0
256	5	3	80486	67	0	0	1	4	0	0	0	0	0	0	0	0
300	6	1	260385	44	0	0	1	0	0	0	0	0	0	0	0	0
301	6	1	260385	40	0	0	0	3	0	0	0	0	0	0	0	0
302	6	1	260385	47	0	0	0	0	0	1	0	0	0	0	0	0
303	6	1	260385	47	0	1	0	1	1	0	0	0	0	0	0	0
305	6	1	260385	47	0	0	0	0	0	0	0	0	0	0	0	0
307	6	1	260385	49	0	0	0	1	6	0	0	0	0	0	0	0
308	6	1	260385	46	0	0	2	2	0	0	1	0	0	0	0	0
309	6	1	260385	46	0	0	0	1	0	0	0	0	0	0	0	0
310	6	1	260385	54	1	0	0	0	0	0	0	0	0	0	0	0
311	6	1	260385	45	0	0	0	0	0	0	1	0	0	0	0	0

Column number																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
312	6	1	260385	46	1	0	0	0	0	0	0	0	0	0	0	0	0
313	6	1	260385	45	0	0	0	0	0	0	0	0	0	0	0	0	0
314	6	1	260385	49	0	0	1	2	2	0	0	0	0	0	0	0	0
315	6	1	260385	50	0	1	0	0	0	0	0	0	0	0	0	0	0
316	6	1	260385	47	0	0	0	4	0	2	0	0	1	0	1	0	0
317	6	1	260385	48	0	0	0	1	0	0	0	0	0	0	0	0	0
318	6	1	260385	47	0	0	1	1	0	0	0	0	0	0	0	0	0
322	6	1	260385	45	0	0	0	0	0	1	0	0	0	0	0	0	0
324	6	1	260385	55	0	0	1	0	0	0	0	0	0	0	0	0	0
325	6	1	260385	46	0	0	0	1	0	0	0	0	1	0	0	0	0
327	6	1	260385	48	0	0	0	0	0	0	0	0	0	0	0	0	0
328	6	1	260385	46	0	0	0	2	0	0	0	0	0	0	0	0	0
329	6	1	260385	46	0	0	1	0	0	0	0	0	0	0	0	0	0
330	6	1	260385	55	0	0	5	0	0	1	0	0	0	0	0	0	0
331	6	1	260385	46	0	0	0	0	0	0	0	0	0	0	0	0	0
332	6	1	260385	46	0	0	0	2	0	0	0	0	0	0	0	0	0
336	6	1	260385	46	1	0	0	1	1	0	0	0	0	0	0	0	0
337	6	1	260385	46	*	0	0	0	0	0	0	0	0	0	0	0	0
338	6	1	260385	49	0	0	0	0	0	0	0	0	0	0	0	0	0
339	6	1	260385	43	0	0	0	1	0	0	0	0	0	0	0	0	0
340	6	1	260385	47	0	0	0	0	0	0	0	1	0	0	0	1	0
341	6	1	260385	48	1	0	0	0	0	0	0	0	0	0	0	0	0
343	6	1	260385	45	0	0	1	0	0	0	0	0	0	0	0	0	0
345	6	1	260385	54	0	0	0	1	0	0	0	0	0	0	0	0	0
346	6	1	260385	44	0	0	0	0	0	0	0	0	0	0	0	0	0
348	6	1	260385	42	0	0	0	0	0	0	0	0	0	0	0	0	0
349	6	1	260385	45	0	0	0	0	5	0	0	0	0	0	0	0	0
304	6	1	260385	59	1	0	0	5	0	0	0	0	0	0	0	0	0
306	6	1	260385	56	*	2	0	10	0	0	0	0	0	0	0	0	0
319	6	1	260385	57	0	0	0	0	0	0	1	0	0	0	0	0	0
320	6	1	260385	60	0	0	0	0	1	1	0	0	0	1	0	0	0
321	6	1	260385	65	0	0	1	0	0	1	0	0	0	0	0	0	0
323	6	1	260385	63	0	0	0	0	0	1	0	0	0	0	0	0	0
326	6	1	260385	67	0	0	0	0	0	0	0	0	0	0	0	0	0
333	6	1	260385	62	0	0	0	0	0	0	0	0	0	0	0	0	0
334	6	1	260385	63	0	0	0	0	0	0	0	0	0	0	0	0	0
335	6	1	260385	56	0	0	1	2	0	0	0	0	0	0	2	0	0
342	6	1	260385	57	0	0	0	15	0	1	0	0	0	0	0	0	0
344	6	1	260385	60	0	0	1	3	0	0	3	0	0	0	0	0	0
347	6	1	260385	57	0	0	1	0	1	0	0	0	0	0	0	0	0
90	7a	1	160985	55	0	0	0	24	*	0	0	0	2	0	0	0	0
92	7a	1	160985	53	*	0	0	0	*	0	0	0	0	0	0	0	0
91	7a	1	160985	63	0	0	0	1	*	1	0	0	0	1	0	0	0
97	7a	1	160985	58	0	0	0	5	*	1	0	0	0	0	0	0	0
100	7a	1	160985	59	0	0	0	6	*	2	0	0	0	0	0	0	0
101	7a	1	160985	63	1	0	0	0	*	0	0	0	0	0	0	0	0
94	7a	1	160985	65	0	0	0	4	*	0	0	0	0	0	0	0	0
1	7a	1	160985	68	0	1	0	3	*	1	0	0	1	0	0	0	0
3	7a	1	160985	67	0	0	0	0	*	0	0	0	0	1	0	0	0
4	7a	1	160985	68	0	2	0	0	*	1	1	0	0	0	0	0	0
5	7a	1	160985	77	*	0	0	0	*	6	0	0	0	0	0	0	0
7	7a	1	160985	73	0	0	0	81	*	6	0	0	0	0	0	0	0
8	7a	1	160985	73	1	0	0	2	*	14	0	0	1	0	0	1	0
10	7a	1	160985	87	0	0	0	11	*	10	0	0	0	0	3	0	0

## Column numbers

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
11	7a	1	160985	87	0	0	0	6	*	16	19	0	107	0	4	0
93	7a	1	160985	80	0	0	0	4	*	8	0	0	0	0	0	1
95	7a	1	160985	74	1	0	0	14	*	2	0	0	0	0	0	0
96	7a	1	160985	76	1	0	1	4	*	3	0	0	0	0	0	0
98	7a	1	160985	69	1	0	0	7	*	2	0	0	0	0	0	5
102	7a	1	160985	78	0	0	0	3	*	3	0	0	0	0	0	0
103	7a	1	160985	67	1	0	0	0	*	0	1	0	0	0	0	0
104	7a	1	160985	71	1	0	0	0	*	1	0	0	0	0	0	0
105	7a	1	160985	84	0	0	1	21	*	3	1	0	1	0	6	0
106	7a	1	160985	86	1	0	1	10	*	269	1	0	0	0	0	0
107	7a	1	160985	82	0	0	0	4	*	2	0	0	0	0	2	0
2	7a	1	160985	92	0	2	0	14	*	19	0	0	1	0	0	0
6	7a	1	160985	96	0	2	2	10	*	51	1	2	3	0	4	0
9	7a	1	160985	93	1	0	0	2	*	54	3	0	2	0	0	0
99	7a	1	160985	95	0	0	0	15	*	127	1	0	0	0	2	0
121	7b	1	30784	62	0	0	0	3	*	0	0	0	0	0	0	0
125	7b	1	30784	60	0	0	0	5	*	0	1	0	0	0	0	0
129	7b	1	30784	63	0	1	0	0	*	3	0	0	0	0	0	0
126	7b	1	30784	64	0	0	0	0	*	4	0	0	0	0	0	0
138	7b	1	30784	95	0	0	5	6	*	60	1	0	2	0	6	0
119	7b	1	30784	67	1	0	0	3	*	0	0	0	0	0	0	0
120	7b	1	30784	72	*	0	0	3	*	5	0	0	0	0	0	0
122	7b	1	30784	85	*	0	0	0	*	0	0	0	0	0	0	0
123	7b	1	30784	71	0	0	1	0	*	9	0	0	0	0	0	0
124	7b	1	30784	71	0	0	0	7	*	0	0	0	1	0	1	0
127	7b	1	30784	76	*	0	0	1	*	3	0	0	0	0	0	0
128	7b	1	30784	81	0	0	0	0	*	13	0	0	0	0	0	0
130	7b	1	30784	79	0	0	2	8	*	0	0	0	0	0	0	0
131	7b	1	30784	81	0	0	0	6	*	9	0	0	1	0	0	0
132	7b	1	30784	76	0	0	0	12	*	10	0	0	0	0	0	0
133	7b	1	30784	75	0	0	0	5	*	0	0	0	0	0	0	0
134	7b	1	30784	81	*	0	0	8	*	36	0	1	1	0	0	0
135	7b	1	30784	75	0	0	0	11	*	13	0	0	0	0	0	0
136	7b	1	30784	69	0	0	0	0	*	1	0	0	0	0	0	0
137	7b	1	30784	79	0	0	0	1	*	1	0	0	0	0	0	0
139	7b	1	30784	68	0	0	0	0	*	2	0	0	0	0	0	0
13	7b	1	30784	60	0	0	1	1	*	0	0	0	0	0	0	0
12	7b	1	30784	67	0	0	0	3	*	1	0	0	1	0	0	0
14	7b	1	30784	67	0	0	0	0	*	0	0	0	0	0	0	0
15	7b	1	30784	69	0	0	0	3	*	0	0	0	0	0	0	0
16	7b	1	30784	73	1	0	0	0	*	10	0	0	0	0	2	0
17	7b	1	30784	72	1	0	0	5	*	0	0	0	0	0	0	0
18	7b	1	30784	72	*	0	0	27	*	4	0	0	0	0	0	0
19	7b	1	30784	80	0	0	1	9	*	29	0	0	0	0	0	0
20	7b	1	30784	71	0	0	0	0	*	3	0	0	1	0	0	0
21	7b	1	30784	68	1	0	0	0	*	1	0	0	0	0	0	0
22	7b	1	30784	83	0	0	0	28	*	5	0	0	1	0	0	0
23	7b	1	30784	90	0	0	0	2	*	30	0	0	0	0	2	0
24	7b	1	30784	90	*	0	0	9	*	37	1	0	0	0	0	0
25	7b	1	30784	71	0	0	0	1	*	4	0	0	0	0	0	0
676	7c	1	10787	54	*	0	0	4	0	0	0	0	0	0	0	0
690	7c	1	10787	54	*	0	1	3	4	1	0	0	0	0	0	0
691	7c	1	10787	54	*	0	0	1	1	0	0	0	0	0	0	0
770	7c	1	10787	55	*	0	0	2	0	0	0	0	0	0	1	0

		Column number														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
666	7c	1	10787	59	*	0	0	2	3	0	0	0	0	0	0	0
681	7c	1	10787	65	*	0	0	2	1	0	0	0	0	0	0	0
683	7c	1	10787	63	*	0	0	0	0	0	1	0	0	0	0	0
687	7c	1	10787	65	*	0	1	0	0	0	0	0	0	0	0	0
726	7c	1	10787	62	*	0	0	0	0	0	0	0	0	0	0	0
761	7c	1	10787	57	*	0	0	0	0	0	0	0	0	0	0	0
763	7c	1	10787	63	*	0	3	2	0	0	0	0	0	0	0	0
765	7c	1	10787	61	*	0	0	0	0	1	0	0	0	0	0	0
766	7c	1	10787	61	*	0	0	0	0	1	0	0	0	0	0	0
767	7c	1	10787	64	*	0	1	7	7	0	0	0	0	0	1	0
768	7c	1	10787	64	*	0	0	2	2	2	0	0	0	0	0	0
771	7c	1	10787	63	*	0	1	0	2	1	0	0	0	0	0	0
772	7c	1	10787	61	*	0	0	0	0	0	0	0	0	0	0	0
773	7c	1	10787	64	*	0	1	2	3	0	0	0	0	0	0	0
774	7c	1	10787	65	*	0	1	0	2	2	4	0	0	0	0	0
777	7c	1	10787	65	*	0	1	1	0	0	0	0	0	0	0	0
784	7c	1	10787	56	*	0	3	0	0	0	0	0	0	0	0	0
667	7c	1	10787	74	*	0	2	0	1	0	0	0	0	0	0	0
668	7c	1	10787	73	*	0	1	0	8	1	4	0	0	0	0	0
669	7c	1	10787	67	*	0	0	0	0	0	0	0	0	0	0	0
670	7c	1	10787	68	*	0	0	0	9	0	0	0	0	0	0	0
671	7c	1	10787	72	*	0	0	2	3	1	0	0	0	0	0	0
672	7c	1	10787	73	*	0	0	4	0	1	1	0	0	0	1	0
673	7c	1	10787	74	*	0	1	24	8	3	0	0	0	0	0	0
674	7c	1	10787	73	*	0	1	2	3	6	0	0	0	0	1	0
675	7c	1	10787	83	*	0	0	0	0	5	0	0	3	0	1	0
677	7c	1	10787	68	*	0	1	1	0	6	0	0	0	0	0	0
678	7c	1	10787	69	*	0	0	2	14	1	0	0	1	0	0	0
680	7c	1	10787	78	*	0	0	2	0	7	1	0	0	0	0	0
682	7c	1	10787	70	*	0	0	0	4	1	0	0	0	0	0	0
684	7c	1	10787	69	*	0	0	1	2	6	4	0	0	0	0	0
685	7c	1	10787	68	*	0	0	1	1	2	0	0	0	0	0	0
686	7c	1	10787	75	*	0	0	7	8	3	0	0	0	0	0	0
688	7c	1	10787	75	*	0	0	1	11	0	2	0	0	0	0	0
689	7c	1	10787	71	*	0	1	0	0	5	0	0	0	0	1	0
692	7c	1	10787	68	*	0	0	0	2	0	0	0	0	0	0	0
750	7c	1	10787	69	*	0	1	0	0	0	0	0	0	0	0	0
751	7c	1	10787	77	*	0	0	1	0	3	0	0	0	0	0	0
752	7c	1	10787	70	*	0	0	0	0	0	0	0	0	0	0	0
753	7c	1	10787	67	*	0	0	0	0	0	0	0	0	0	0	0
754	7c	1	10787	75	*	1	0	0	0	1	1	0	0	0	1	0
755	7c	1	10787	84	*	0	3	3	4	10	0	0	0	0	0	0
757	7c	1	10787	75	*	0	0	0	0	2	0	0	0	0	0	0
758	7c	1	10787	77	*	0	0	0	0	0	0	0	0	0	0	0
759	7c	1	10787	71	*	0	0	0	0	4	0	0	0	0	0	0
760	7c	1	10787	67	*	0	0	0	0	2	0	0	0	0	0	0
762	7c	1	10787	66	*	0	3	0	0	0	0	0	0	0	0	0
764	7c	1	10787	74	*	0	0	0	0	4	0	0	0	0	0	0
769	7c	1	10787	67	*	0	1	0	0	0	2	0	0	0	0	0
775	7c	1	10787	73	*	0	0	0	4	1	0	0	0	0	0	0
776	7c	1	10787	74	*	0	0	6	3	6	0	0	0	0	0	0
778	7c	1	10787	82	*	2	0	2	13	20	0	0	0	0	0	0
779	7c	1	10787	79	*	0	0	2	0	10	0	0	0	0	0	0
780	7c	1	10787	78	*	0	0	46	3	9	0	0	0	0	0	0

Column numbers

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
781	7c	1	10787	74	*	0	1	3	0	9	0	0	0	0	0	0
782	7c	1	10787	67	*	0	0	1	0	0	0	0	0	0	0	0
783	7c	1	10787	70	*	0	2	3	0	0	0	0	0	0	0	0
785	7c	1	10787	69	*	0	1	4	4	2	0	0	0	0	0	0
756	7c	1	10787	107	*	0	8	18	18	430	1	8	0	0	8	0
749	7d	1	30787	55	*	0	0	7	4	0	0	0	0	0	1	0
701	7d	1	30787	60	*	0	0	0	1	0	0	0	0	0	0	0
703	7d	1	30787	64	*	0	0	0	0	0	0	0	0	0	0	0
704	7d	1	30787	61	*	0	0	0	0	1	0	0	0	0	0	0
719	7d	1	30787	65	*	0	0	0	2	1	0	0	0	0	0	0
720	7d	1	30787	61	*	0	0	0	0	0	0	0	0	0	0	0
727	7d	1	30787	59	*	0	0	2	1	0	0	0	0	0	1	0
728	7d	1	30787	56	*	0	1	0	0	0	0	0	0	0	0	0
735	7d	1	30787	65	*	0	0	2	4	0	0	0	0	0	2	0
736	7d	1	30787	59	*	0	0	0	0	0	0	0	0	0	0	0
742	7d	1	30787	61	*	0	1	0	0	0	0	0	0	0	0	0
745	7d	1	30787	64	*	0	0	1	6	1	0	0	0	0	0	0
748	7d	1	30787	63	*	0	1	7	4	1	0	0	0	0	0	0
679	7d	1	30787	74	*	0	0	1	4	1	0	0	0	0	1	0
693	7d	1	30787	68	*	0	0	1	2	7	0	0	0	0	0	0
694	7d	1	30787	71	*	0	1	0	0	0	0	0	0	0	0	0
695	7d	1	30787	77	*	0	1	7	4	0	0	0	0	0	0	0
696	7d	1	30787	75	*	0	1	2	1	2	0	0	0	0	0	0
697	7d	1	30787	72	*	0	1	0	5	6	1	0	0	0	0	0
698	7d	1	30787	67	*	0	0	11	6	1	0	0	0	0	0	0
699	7d	1	30787	66	*	0	0	0	0	3	0	0	0	0	0	0
700	7d	1	30787	72	*	0	0	1	0	0	0	0	0	0	0	0
702	7d	1	30787	77	*	0	0	10	5	5	0	0	0	0	0	0
705	7d	1	30787	70	*	0	1	0	1	4	0	0	0	0	0	0
706	7d	1	30787	75	*	0	1	0	0	12	0	0	0	0	0	0
707	7d	1	30787	80	*	0	0	0	3	0	0	0	0	0	0	0
708	7d	1	30787	67	*	0	1	2	0	0	0	0	0	0	0	0
709	7d	1	30787	80	*	0	0	6	0	3	0	0	0	0	0	0
710	7d	1	30787	81	*	0	0	1	2	1	0	0	0	0	0	0
711	7d	1	30787	67	*	0	1	0	0	0	0	0	0	0	0	0
712	7d	1	30787	76	*	0	0	7	7	11	0	0	2	0	0	0
713	7d	1	30787	73	*	0	1	1	0	4	0	0	0	0	0	0
715	7d	1	30787	71	*	0	0	1	0	2	0	0	0	0	0	0
716	7d	1	30787	87	*	0	0	6	0	3	0	0	0	0	0	0
717	7d	1	30787	76	*	0	2	7	2	10	0	0	0	0	0	0
718	7d	1	30787	69	*	0	0	2	1	0	0	0	0	0	0	0
721	7d	1	30787	78	*	0	0	0	2	1	0	0	0	0	1	0
722	7d	1	30787	73	*	0	3	7	3	3	1	0	0	0	1	0
723	7d	1	30787	77	*	0	0	4	0	1	0	0	0	0	0	0
724	7d	1	30787	82	*	0	0	1	0	6	0	0	0	0	0	0
725	7d	1	30787	69	*	0	0	2	3	3	0	0	0	0	0	0
729	7d	1	30787	72	*	0	0	1	3	0	0	0	0	0	0	0
730	7d	1	30787	79	*	0	0	6	3	18	0	0	8	1	0	0
731	7d	1	30787	66	*	0	0	3	0	0	0	0	0	0	0	0
732	7d	1	30787	68	*	0	0	0	0	2	0	0	1	0	0	0
733	7d	1	30787	77	*	0	0	0	3	4	0	0	0	0	0	0
734	7d	1	30787	71	*	0	0	2	0	0	1	0	1	0	0	0
737	7d	1	30787	66	*	0	0	0	0	0	1	0	0	0	0	0
738	7d	1	30787	69	*	0	0	0	0	3	0	0	0	0	0	0

		Column number																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		739	7d	1	30787	73	*	0	0	2	0	3	0	0	0	0	0	0
		740	7d	1	30787	72	*	0	2	0	0	1	0	0	0	0	0	0
		741	7d	1	30787	70	*	0	0	1	4	2	2	0	0	0	0	0
		743	7d	1	30787	67	*	0	1	1	0	0	0	0	0	0	0	0
		744	7d	1	30787	69	*	0	4	0	6	2	1	0	0	0	0	0
		746	7d	1	30787	72	*	0	0	1	3	9	0	0	0	0	2	0
		747	7d	1	30787	66	*	0	0	1	0	1	2	0	0	0	0	0