intermittently toxic in Queensland (especially coral trout and Spanish mackerel), may weaken industry's argument that it is satisfying dutyof-care issues with regard to ciguatera.

Origin of the toxins involved in ciguatera

Gambierdiscus toxicus is now widely accepted as the organism that produces the toxins (ciguatoxins and gambiertoxins) involved in ciguatera (T. Yasumoto, M. Holmes). Indeed this organism may be the only source of toxins involved in ciguatera. Structure for GTX-4A (52 epi-GTX-4B), the major gambiertoxin produced by a Rangiroa Atoll strain of *G. toxicus* grown in culture, was presented at the meeting (T. Yasumoto). This toxin is likely to be the precursor of ciguatoxin-2 (CTX-2).

From this work we now have a much clearer understanding of how the ciguatera toxins arise. GTX-4A and further oxidised forms could undergo acid-catalysed spiroisomerisation to the other ciguatoxins found in fish (ie GTX-4B, CTX-I and -3). The structure of maitotoxin was also presented at this meeting by T. Yasumoto. Maitotoxin consists of numerous transfused polyether rings, as do the ciguatoxins, but otherwise is not closely related to the ciguatoxins.

At the present time little is known of the environmental factors that cause the upsurges of ciguatera (M. Holmes, J-P. Vernoux, U. Kaly, S. Hahn, J. Babinchak, R. Bagnis, G. Hallegraeff, Y. Hokama, P. Scheuer). Further research in this area is expected to result in significant advances, perhaps leading to an understanding of how human activities influence the distribution of ciguateric fish.

Also discussed at the meeting was the potential for a range of other toxic algae to be introduced into Australia with resultant outbreaks of diarrhoeic, paralytic, neurotoxic and amnesic shellfish poisoning (G. Hallegraeff). Such outbreaks may arise through ballast water introduction and / or environmental degradation. These biotoxins have the potential to severely damage a number of fisheries in the Pacific as well as Australia.

Fish poisoning cases (1991–1992)

The South Pacific Epidemiological and Health Information Service records between 3,500 and 5,000 cases of fish poisoning each year (see tables on the following pages). Not all of these are due to ciguatera intoxication.

The effect that fish poisoning has on island societies is largely unknown due to the poor reporting of case histories. To improve the current under reporting, it is necessary to encourage both health and fisheries workers in the region to record cases histories on a standard ciguatera reporting form (attached with this bulletin), and to send them to SPC where they can be entered in a database.

This form can be used as a template for making multiple copies, or, where copying facilities are unavailable, the Resource Assessment Section (contact Paul Dalzell) will be happy to supply copies. Source: South Pacific Epidemiological and Health Information Services (SPEHIS) SPC, Noumea

We also would be glad to hear from persons who have criticisms or suggestions for improving the form.

Finally, we would encourage fisheries workers in the region to work in co-operation with their colleagues in their health departments to record all incidents of ciguatera that they hear about. Only with your help can we gauge the true extent of this problem and plan to coordinate future work accordingly.

Countries Currently in South Pacific Commission	jan 91	fév 91	mars 91	avr 91	mai 91	juin 91	juil 91	aoû 91	sep 91	oct 91	nov 91	déc 91	Cum. T 1/91 - 1 Cases]	otal 2/91 Rates*
American Samoa	0	0	0	0	0	10	0	0	1	3	0	0	14	0.4
Cook Islands	4	ω	3	L	16	16	17	8	4	18	10	7	113	6.6
Fiji	73	41	163	91	92	153	116	120	130	71	87	70	1,207	1.7
French Polynesia	60	70	48	36	53	84	47	48	52	47	06	83	718	4.1
Fed. States of Micronesia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Guam	0	0	0	0	1	0	5	0	1	0	10	0	17	0.1
Kiribati	241	0	70	85	0	0	0	0	0	0	0	0	396	5.8
Marshall Islands	L	15	6	11	11	10	11	11	11	10	6	0	115	3.0
Nauru	0	0	0	0	0	0	0						0	0.0
New Caledonia	27	28	17	26	28	13	0	0	0	0	0	0	139	0.8
Niue	0	0	0	0	0	0	0	0	0	4	0	0	4	1.6
Northern Mariana Islands	1	0	1	3	0	0	2	2	0	0	0	0	6	0.4
Palau	0	0	0	0	0	0	0		0					
Pitcairn Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Papua New Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Tokelau Islands	0	0	0	0	0	0	L	4	12	4	0	47	74	46.3
Tonga	0	0	0	Э	0	0	0	0	0	0	0	0	ε	0.0
Tuvalu	30	8	33	13	12	25	68	11	4	9	17	30	257	30.2
Vanuatu	51	6	48	52	0	0	0	0	0	0	0	44	204	1.4
Wallis and Futuna	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Western Samoa	8	17	12	12	19	22	9	13	20	21	2	5	157	1.0
* Number of active cases per 1	1,000 popul	lation										Total	3,427	

SPEHIS – Monthly summaries – Fish poisoning – 1991

Countries		007 <i>3</i>	0				CO 1::					00 - 7 F	Cum. T	otal
South Pacific Commission	Jall 72	16/ 72	111a15 72	avi 72	11141 72	76 mnf	76 Imf	a0u 92	sep 92	001 37	76 101	nec 27	Cases	Rates*
American Samoa	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cook Islands	19	15	5	8	9	5	4	27	26	15	13	5	148	8.7
Fiji	141	144	106	99	11	84	92	32	115	179	165	24	1,159	1.6
French Polynesia	91	63	80	66	39	74	48	66	76	42	49	58	773	4.4
Fed. States of Micronesia	0	0	0	0	0	0	0	0	9	0	0	0	9	0.1
Guam	0	0	1	0	0	1	0	0	0	0	0	0	2	0.0
Kiribati	126	89	86	93	219	112	65	51	59	79	61	132	1,172	17.3
Marshall Islands	∞	13	5	16	7	13	29	15	44	37	15	14	216	5.7
Nauru													0	0.0
New Caledonia	36	19	15	45	18	13	2	0	0	0	0	0	148	0.9
Niue	0	0	0	0	0	0	1	0	0	0	0	0	1	0.4
Northern Mariana Islands	3	2	0	0	0	1	0	0	0	0	0	0	29	1.4
Palau													0	0.0
Pitcairn Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Papua New Guinea													0	0.0
Solomon Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Tokelau Islands	0	0	0	0	0	0	0	0	0	б	9	4	13	8.1
Tonga	0	0	0	ω	0	0	0	0	9	1	0	0	L	0.1
Tuvalu	14	17	14	15	19	9	8	31	12	17	6	9	168	19.8
Vanuatu	73	136	81	73	88	LL	76	72	60	76	92	105	1,009	7.0
Wallis and Futuna													0	0.0
Western Samoa	17	16	12	18	0	8	2	2	12	14	11	10	122	0.8
* Number of active cases per 1	.,000 popu	lation										Total	4,973	

SPEHIS – Monthly summaries – Fish poisoning – 1992

Secretariat of the Pacific Community SEAFOOD POISONING REPORT FORM

Please fill in the answers to the questions completely. Tick the boxes where appropriate.

Details of person filling	in report form:			
Name	Job/ Position			
Contact address				
Date:	Signature			
	1			
Poisoned person's detai				
	Sex (M/F)Age (yrs)			
Address				
Details of the seafood th	at caused the poisoning: (tick all the boxes that apply)			
Type of food V	Where caught How preserved What eaten How eaten			
Fish	River Fresh, no ice _ Head Unprepared (raw)			
Crab	Mangrove Fresh, iced Flesh Marinated			
Lobster	Beach Frozen Skin Cooked			
Other crustacean	Reef patch Salted Liver L			
Gastropod*	Lagoon Dried Roe			
Bivalve*	Outer reef Smoked Other organs How many others			
Other mollusc _	Open sea Pickled (specify) ate this meal?			
Other (specify)	Other (specify) Other (specify) felt sick?			
	were admitted			
Unknown	Unknown Unknown Unknown to hospital?			
What is the focul finite of What is the English name of Name of vendor or restau Name of place it was cau When was the food eater When did you first feel s * Gastropods are one-s Bivalves are two-she	e of the seafood?			
Symptoms: (tick all the b	poxes that apply)			
Burning or pain when t	ouching cold water D Pin pricking sensation on touching water D			
Tingling or numbness sensations Strange taste in mouth				
Difficulty or pain in urinating Skin itching or redness				
Difficulty in breathing	Excessive salivation Fever or chills			
Difficulty in walking	Excessive sweating Headache			
Difficulty in talking	Diarrhoea Joint aches			
Eye irritation	Vomiting			
Madical data:				
Pulse	Blood pressure/ Pupils			
T				
Date of death	Autopsy findings			
Other information				

Please return this form to:

Secretariat of the Pacific Community, BP D5, Nouméa Cedex, 98848 New Caledonia