

Appendix 1. Occurrence of alkaloids in skin extracts of *Oophaga pumilio*. Major alkaloids (>50 µg/100 mg skin); minor alkaloids (> 5 µg/100 mg skin); trace alkaloids (< 5 µg/100 mg skin). The wet weight of skins of *D. pumilio* varies from population to population ranging from 40 mg to 100 mg. The number in parentheses under an entry indicates the number of isomers. Usually, one isomer is predominant. The alkaloids in quotations in site 20b require further study before being assigned code designations: Probably PTXs. For more quantitative aspects, see the GC-FID traces.

Location of Population (color morph)	Site	Collection date Number of skins		HTX; PTX; aPTX; hPTX; DHQ; OHQ; 3,5-P; 3,5-I; 5,8-I; Dehydro-5,8-I; 5,6,8-I; Lehm; 4,6-Q; 1-4,-Q; CPQ; Izidine; Pyr; Pip; Spiro; Tri; Unclass
Isla Escuda de Veraguas, Panamá	1	May 1987 4	Major Minor Trace	None. PTX 307A, 309A, 323A ; aPTX 325A ; 5,8-I 251B ; Pip 241D . 5,8-I 205A, 207A, 235B ; 5,6,8-I 223A .
Punta Valiente, Bocas, Panamá	2a	October 1981 10	Major Minor Trace	None. PTX 251D, 307A ; aPTX 267A, 323B ; DHQ 195A ; 5,8-I 205A, 207A, 235B ; 5,6,8-I 223A . DHQ 221B ; Dehydro-5,8-I 207E ; 5,6,8-I 207C ; 4,6-Q 195C ; Pip 241D .
	2b	April 1984 20	Major Minor Trace	None. PTX 251D ; aPTX 267A ; DHQ 195A ; 5,8-I 205A (2), 207A ; 1,4-Q 233A . 3,5-I 195B ; 5,8-I 217B ; 5,6,8-I 223A ; Pyr 197B .
Chiriquí Grande, Bocas, Panamá (Red Morph)	3	October 1981 10	Major Minor Trace	None. aPTX 323B ; DHQ 181D ; 5,8-I 203A ; 5,6,8-I 223A, 263A ; Unclass 167C . PTX 307A ; aPTX 267A, 305A ; DHQ 195A, 223F, 293A ; 5,8-I 271A ; Dehydro-5,8-I 269D ; Tri 203B ; Unclass 181C, 267G, 309F .
Chiriquí Grande, Bocas, Panamá (Green Morph)	4a	October 1981 10	Major Minor Trace	5,6,8-I 231B . aPTX 267A ; 5,8-I 207A, 209B ; 5,6,8-I 223A . PTX 281A ; DHQ 181D, 195A, 221B ; 5,8-I 225D .
	4b	February 1992 8	Major Minor Trace	5,6,8-I 231B . DHQ 195A ; 5,6,8-I 223A ; Unclass 207N . 5,8-I 209B, 231C ; 5,6,8-I 231B, 251M, 263A, 267J ; 4,6-Q 195C ; Lehm 275A ; Unclass 209G .
Rumpala, Bocas, Panamá (Red Morph)	5	October 1981 10	Major Minor Trace	aPTX 267A . PTX 251D ; DHQ 195A . DHQ 293A ; 3,5-I 195B ; 5,8-I 203A, 209B .
Rumpala, Bocas, Panamá (Green Morph)	6	October 1981 10	Major Minor Trace	None. aPTX 323B ; DHQ 195A ; Spiro 236, 252A . PTX 309C ; DHQ 293A ; 5,8-I 205A ; 5,6,8-I 223A ; Izidine 211B ; Pyr 197B .

Rumpala, Bocas, Panamá (Yellow Population)	7	October 1981 10	Major Minor Trace	aPTX 267A ; DHQ 195A ; 5,8-I 209B . PTX 251D ; aPTX 323B ; 5,8-I 207A , 235B ; 5,6,8-I 223A . DHQ 219C ; 5,8-I 225D ; 5,6,8-I 209C ; Izidine 219E ; Unclass 207F .
Río Gloria, Bocas, Panamá	8	February 1992 20	Major Minor Trace	HTX 285A ; DHQ <i>cis</i> - 195A , 269AB ; 5,8-I 205A (2). HTX 283A , 285C , 291A ; PTX 251D ; aPTX 267A ; 3,5-P 251K (2); 5,8-I 207A ; 5,6,8-I 223A . HTX 287A ; DHQ <i>trans</i> - 195A , 269B ; 3,5-P 223H ; 3,5-I 195B ; 5,8-I 203A ; Dehydro-5,8-I 201A ; 5,6,8-I 231B , 263A ; Unclass 207N .
Cerro Miramar, Bocas, Panamá	9a	October 1981 5	Major Minor Trace	None. HTX 283A , 285A , 285C ; PTX 251D ; aPTX 267A ; DHQ 195A , 269AB ; 5,8-I 203A , 205A , 207A ; 5,6,8-I 207C , 231B . HTX 287A , 287B ; DHQ 231E ; Izidine 223E , 265C ; Pyr 183B ; Unclass 167C , 279A .
	9b	October 1983 10	Major Minor Trace	None. HTX 283A , 285A , 285C ; PTX 251D ; aPTX 267A ; DHQ 195A , 269AB ; 3,5-P 223H ; 5,8-I 203A , 205A (2), 207A ; 5,6,8-I 231B . DHQ 219A , 223F , 243A ; 5,8-I 209I ; 5,6,8-I 223A ; Izidine 265C ; Unclass 279A .
Isla Cayo Agua, Bocas, Panamá	10a	October 1981 10	Major Minor Trace	PTX 251D ; aPTX 267A ; DHQ 195A ; 5,8-I 205A (2). PTX 307A ; aPTX 323B ; 5,8-I 207A , 235B . 3,5-P 209K ; 4,6-Q 195C ; Unclass 265R (2).
	10b	April 1984 20	Major Minor Trace	DHQ 195A . PTX 251D , 307A ; aPTX 267A ; 5,8-I 205A (2), 235B . PTX 323A ; aPTX 323B ; 5,6,8-I 265O (2).
Isla Split Hill, Bocas, Panamá	11a	October 1981 10	Major Minor Trace	DHQ 195A . HTX 283A , 285A , 285C ; PTX 307A , 323A ; aPTX 325A ; 5,8-I 235B . HTX 287A , 287B ; aPTX 253A ; DHQ 269AB ; 5,8-I 197C , 205A ; 5,6,8-I 223A ; 4,6-Q 195C ; 1,4-Q 219B ; Izidine 241E .
	11b	November 1983 20	Major Minor Trace	None. HTX 283A , 285A , 285C ; PTX 307A , 323A ; aPTX 325A ; DHQ 195A , 269AB ; 3,5-P 223H ; 5,8-I 235B ; 5,6,8-I 219N , Izidine 223I . PTX 307F (2); aPTX 267A ; 5,6,8-I 275E ; Unclass 265R (2).
	11c	February 1992 39	Major Minor Trace	None. DHQ 195A ; 5,8-I 205A , 207A , 235B ; 1,4-Q 231A , 233A . PTX 277B , 307A ; aPTX 267A , 323B , 339A ; 5,8-I 209I , 219F .
Isla Popa (North), Bocas, Panamá	12a	October 1981 10	Major Minor	None. PTX 251D ; aPTX 267A ; DHQ 195A ; 5,8-I 205A ; 1,4-Q 233A .

			Trace	5,6,8-I 223A, 231B ; 1,4-Q 231A .
	12b	November 1983 20	Major Minor Trace	None. PTX 251D ; aPTX 267A ; DHQ 195A ; 5,8-I 205A (2), 207A ; 5,6,8-I 231B ; 1,4-Q 233A . 5,8-I 209I, 217B, 235B ; Dehydro-5,8-I 243F ; 1,4-Q 231A , Izidine 223I .
Mainland, NW of Isla Split Hill, Bocas, Panamá	13a	October 1981 10	Major Minor Trace	PTX 307A . PTX 307B, 323A ; aPTX 323B ; DHQ 195A ; 5,8-I 205A, 235B ; Pyr 197B . PTX 251D ; aPTX 253A, 267A ; 3,5-I 195B ; 5,8-I 225D, 251B, 253B ; Izidine 241E, 265C .
	13b	November 1983 20	Major Minor Trace	PTX 307A ; 5,8-I 205A (2), 235B . PTX 323A ; aPTX 323B ; DHQ 195A ; Pyr 197B . PTX 305B, 307F (2), 309A ; 5,8-I 207A (2), 223J ; Tri 193B .
	13c	February 1986 15	Major Minor Trace	PTX 307A ; 5,8-I 205A (2) ; Pyr 197B (2) . PTX 323A ; aPTX 323B ; DHQ 195A ; 5,8-I 235B . PTX 307F (2), 309A ; aPTX 267A ; 3,5-I 195B ; 5,8-I 207A (3), 223J ; 5,6,8-I 195G ; Tri 193B ; Unclass 209G .
Aguacate Bocas, Panamá	14	February 1992 17	Major Minor Trace	5,8-I 209I . HTX 283A, 285A, 285C, 287A ; aPTX 267A ; DHQ 269AB ; 3,5-P 223H (2) ; 5,8-I 223J ; Tri 221G (2) . DHQ 195A, 223F ; 5,8-I 203A, 205A, 207A ; 5,6,8-I 223A, 231B ; Lehm 275A ; Pip 267K ; Tri 207GH, 207P .
Cayo Nancy, Bocas, Panamá	15a	October 1981 1	Major Minor Trace	DHQ 195A . aPTX 323B ; 5,8-I 207A . PTX 251D, 307A ; aPTX 267A ; 5,8-I 203A, 205A, 223D .
	15b	November 1983 10	Major Minor Trace	DHQ 195A . PTX 307A . PTX 251D ; aPTX 267A .
Isla Bastimentos, Sol Creek, Bocas, Panamá	16a	September 1987 11	Major Minor Trace	PTX 307A ; DHQ 195A ; 5,8-I 205A (2) . PTX 323A ; aPTX 267A, 323B ; 5,8-I 203A, 207A, 235B . PTX 251D, 277B, 307F (2), 309A ; 5,6,8-I 223A, 251S ; Unclass 267I (3) .
	16b	February 1992 25	Major Minor Trace	None. PTX 307A ; DHQ 195A ; 3,5-P 223H (2) ; 5,8-I 205A (2), 207A, 235B ; 5,6,8-I 223A . PTX 277B, 307F (2), 309A ; aPTX 267A, 323B ; 5,8-I 203A, 205A ; 5,6,8-I 275E, 277E ; Pip 241D ; Tri 193B .
Isla Bastimentos, Macca Bite, Bocas, Panamá	17a	October 1981 10	Major Minor Trace	Tri 193B . 3,5-I 195B ; 5,8-I 205A, 207A (2), 235B ; 5,6,8-I 231B . PTX 251D ; aPTX 267A, 325A ; DHQ 195A ; 5,8-I 239C, 239D ; 5,6,8-I 223A, 237C ; 4,6-Q 195C ; Pip 241D .
	17b	February 1992 20	Major Minor	None. 3,5-P 251K (2) ; 3,5-I 195B ; 5,6,8-I 223A; 231B, 237L ; Tri 193B .

			Trace	HTX 291A ; PTX 251D , 253F ; aPTX 267A ; DHQ 269AB ; 3,5-P 195F , 223H (2); 3,5-I 275C ; 5,8-I 235B ; 5,6,8-I 353B ; Izidine 211F ; Pyr 197B ; Pip 239O , 241D , 241G , 267K (2), 269C .
Isla Bastimentos, New Guinea, Bocas, Panamá	18	February 1986 15	Major Minor Trace	None. PTX 251D ; aPTX 267A ; DHQ 195A ; 5,8-I 167A , 205A ; 1,4-Q 279E ; Tri 223P . 3,5-P 195F ; 5,8-I 235B .
Isla Bastimentos, New Guinea, Inland, Bocas, Panamá	19	March 2000 5	Major Minor Trace	DHQ <i>cis</i> - 195A ; 5,6,8-I 223A . aPTX 267A ; OHQ 193D ; 3,5-P 251K ; 5,8-I 205A (2). PTX 307A ; 5,8-I 207A (2); 5,6,8-I 237C ; Unclass 323I , 339F .
Isla Bastimentos, Short Cut Pier, Bocas, Panamá	20a	March 2000 5	Major Minor Trace	5,8-I 205A . DHQ <i>cis</i> - 195A ; 3,5-I 195B ; 5,8-I 235B "; 5,6,8-I 223A , 237C . 5,8-I 205A , 207A , 217B ; Dehydro-5,8-I 221J ; 5,6,8-I 231B ; Unclass 279I , 281G , 323I , 339F .
	20b	August 2003 5	Major Minor Trace	5,8-I 205A , 235B ". PTX "321", "325" (3); DHQ 195A ; 5,8-I 205A , 207A (2); 5,6,8-I 223A , 231B , 237C ; Unclass 269G . 3,5-P 223H ; 5,8-I 279D ; Dehydro-5,8-I 221J ; Unclass 235P , 323I .
Isla Bastimentos, North of Short Cut Pier, Bocas, Panamá	20c	March 2000 5	Major Minor Trace	DHQ 195A . 5,6,8-I 231B , 237C , 263A ; Izidine 205F ; Tri 205B , 219I (2). PTX 307A , 323A ; aPTX 293N ; 3,5-P 223H ; 3,5-I 195B ; 5,8-I 205A , 235B "; Dehydro-5,8-I 201A ; 5,6,8-I 223A ; Spiro 236 , 252A ; Unclass 279I , 339F .
Isla Bastimentos, Red Frog Beach, Bocas, Panamá	21	August 2003 5	Major Minor Trace	DHQ 195A . PTX 251D ; 5,8-I 205A , 271A ; 5,6,8-I 277E ; Pip 183A . aPTX 267A , 309D ; 5,8-I 203A , 205A , 207A (2), 223J ; Dehydro 5,8-I 221J ; 5,6,8-I 231B , 275E (2); Spiro 252A .
Isla Bastimentos, Pasture near Wizard Beach, Bocas, Panamá	22	March 2000 5	Major Minor Trace	DHQ 195A . PTX 323A ; 5,8-I 235B "; Tri 205B . PTX 277B , 307A , 307F (2); aPTX 323B ; 3,5-P 223H ; 5,8-I 205A , 233D , 251B ; 5,6,8-I 223A , 231B ; Unclass 339F .
Isla Bastimentos, Wizard Beach, Bocas, Panamá	23	March 2000 5	Major Minor Trace	None. DHQ <i>cis</i> - 195A ; Tri 219I . PTX 251D , 307A ; aPTX 267A , 293N , 323B ; DHQ <i>trans</i> - 195A , 219D ; 3,5-P 223H ; 3,5-I 195B ; 5,6,8-I 223A , 231B , 263A ; Izidine 205F ; Pip 197F ; Tri 205B , 205H ; Unclass 279I , 339F .
Isla Bastimentos, Northwest Coast, Bocas, Panamá	24a	October 1972 10	Major Minor Trace	PTX 307A , 323A . DHQ 195A . aPTX 267A , 307C , 323B , 339A ; 5,8-I 203A , 223D , 235B , 251B .

(Red Morph)	24b	March 1980 10	Major Minor Trace	PTX 307A, 323A . DHQ 195A ; 5,8-I 251B ; Spiro 236, 252A . aPTX 323B ; hPTX 223G ; DHQ 211A ; 5,8-I 235B ; Spiro 222 ; Tri 205B .
(Green Morph)	24c	March 1980 10	Major Minor Trace	PTX 307A, 323A . DHQ 195A ; 5,8-I 251B ; Spiro 236, 252A . aPTX 323B ; hPTX 223G ; DHQ 211A ; 5,8-I 235B ; Spiro 222 ; Tri 205B .
	24d	October 1981 10	Major Minor Trace	PTX 307A, 323A ; DHQ 195A ; Spiro 236 . 5,8-I 205A, 251B ; Spiro 252A . PTX 307F (2); aPTX 267A, 323B, 339A ; hPTX 223G ; DHQ 211A ; 5,8-I 167A, 203A, 207A, 223D, 235B ; 5,6,8-I 223A ; Pyr 183B ; Spiro 222 ; Tri 205B .
	24e	September 1987 4	Major Minor Trace	PTX 307A, 323A ; DHQ 195A . DHQ 211A ; 5,8-I 205A, 251B ; Spiro 236, 252A . PTX 277B ; aPTX 323B ; 5,6,8-I 223A .
	24f	February 1992 66	Major Minor Trace	PTX 307A, 323A ; DHQ 195A ; Spiro 236 . 5,8-I 205A, 235B ; Spiro 252A . PTX 277B, 281A ; aPTX 323B ; DHQ 211A ; 5,8-I 251B ; 5,6,8-I 223A ; Tri 205B .
Isla Bastimentos, Northwest Coast, Brust, Bocas, Panamá	25a	March 2000 5	Major Minor Trace	5,8-I 235B ". PTX 307A, 323A ; aPTX 323B ; DHQ <i>cis</i> - 195A ; 5,8-I 233D ; 5,6,8-I 223A ; Spiro 236, 252A ; Tri 205B . PTX 277B, 289C, 307F (2); 309A ; 3,5-P 223H ; 5,8-I 207A, 251B (2); Dehydro-5,8-I 201A, 221J, 233E ; Pip 197F ; Spiro 222 .
	25b	August 2003 5	Major Minor Trace	DHQ <i>cis</i> - 195A ; 5,8-I 235B ". PTX 307A, 323A ; Tri 191B . PTX 307F (2); 5,8-I 207A ; Dehydro-5,8-I 201A ; Tri 205B .
Isla Bastimentos, Northwest Coast, Heliconia, Bocas, Panamá	26a	March 2000 5	Major Minor Trace	PTX 307A, 323A ; DHQ <i>cis</i> - 195A ; 5,8-I 235B ". aPTX 323B ; 3,5-P 223H ; 5,8-I 205A (2), 207A ; 5,6,8-I 223A ; Tri 205B . PTX 277B, 307F (2); aPTX 267A ; DHQ 211A ; 3,5-P 251K ; 5,8-I 233D, 247E, 251B ; Dehydro-5,8-I 201A ; 5,6,8-I 275E .
	26b	August 2003 5	Major Minor Trace	5,8-I 235B ". PTX 307A, 323A ; DHQ 195A ; 3,5-P 223H ; 5,6,8-I 223A ; Tri 191B, 205B . PTX 307F (2); 5,8-I 205A, 251B ; Dehydro-5,8-I 201A, 233E ; 5,6,8-I 231B .
Isla Bastimentos, Northwest Coast, Cyclanthus, Bocas, Panamá	27a	March 2000 5	Major Minor Trace	5,8-I 235B ". PTX 307A, 323A ; aPTX 323B ; DHQ <i>cis</i> - 195A ; 5,8-I 233D ; Spiro 236 ; Tri 205B . PTX 277B, 289C, 307F (2); 3,5-P 223H ; 3,5-I 195B ; 5,8-I 205A, 207A, 251B (2); Dehydro 5,8-I 201A, 233E ; 5,6,8-I 275E (2).
	27b	August 2003	Major	PTX 323A ; 5,8-I 235B ".

	5		Minor	PTX 307A ; DHQ 195A ; 3,5-P 223H ; 5,8-I 205A , 207A , 233D ; Dehydro 5,8-I 201A ; Spiro 236 , 252A ; Tri 191B , 205B .
			Trace	PTX 251D , 307F (2); aPTX 267A ; 5,8-I 205A , 243B , 251B ; Dehydro 5,8-I 201A , 221J ; 5,6,8-I 275E , 277E ; Izidine 223E ; Spiro 222 .
Isla Bastimentos, Northwest Coast, Faro, Bocas, Panamá	28a	February 1986 22	Major Minor Trace	PTX 307A , 323A ; DHQ 195A . aPTX 267A ; DHQ 211A ; 3,5-I 195B ; 5,8-I 205A , 235B . PTX 251D .
	28b	March 2000 5	Major Minor Trace	5,8-I 205A , 235B ". PTX 237A , 251D , 307A ; aPTX 267A ; DHQ <i>cis</i> - 195A ; 5,8-I 207A ; 5,6,8-I 223A ; Tri 205B . PTX 323A ; aPTX 323B ; 3,5-P 223H 5,8-I 205A , 209B , 235B '; Dehydro 5,8-I 201A , 221J ; 5,6,8-I 231B .
	28c	August 2003 5	Major Minor Trace	5,8-I 205A (2). DHQ 195A ; 5,8-I 207A (2); 5,6,8-I 223A . PTX 251D ; aPTX 323B ; 3,5-P 223H ; 5,8-I 245B ; Dehydro 5,8-I 201A ; 5,6,8-I 223A , 263A , 277E ; Izidine 215 ; Unclass 253N , 269G .
Isla Bastimentos, Punta Juan Brown, Bocas, Panamá	29a	September 1987 6	Major Minor Trace	None. PTX 209F , 307A , 323A ; aPTX 225E , 267A , 323B ; hPTX 223G ; DHQ 195A ; 5,8-I 205A (2), 207A , 251B (2). PTX 251D , 307F (2); DHQ 211A ; 3,5-P 195F ; 3,5-I 195B ; 5,8-I 223D , 235B ; Dehydro-5,8-I 221J ; Tri 205B .
	29b	March 2000 5	Major Minor Trace	PTX 307A , 323A ; DHQ <i>cis</i> - 195A ; 5,8-I 235B ". aPTX 323B ; 5,8-I 205A (2), 233D , 235B '; 5,6,8-I 223A , 235E ; Tri 205B . PTX 277B , 289C , 307F (2), 309A ; aPTX 267A ; 3,5-P 223H ; 5,8-I 251B (2), 271A (2); Dehydro-5,8-I 221J , 233E , 269D ; 5,6,8-I 231B , 235E , 249H , 293C .
Isla Colon, Northeast Coast, Bocas, Panamá	30	May 1977 10 Arboreal frogs	Major Minor Trace	None. HTX 283A , 285A , 285C ; aPTX 325A ; 3,5-I 195B ; 5,8-I 205A ; 1,4-Q 257D ; Pip 269C ; Unclass 281C . HTX 287A , 287B ; DHQ 221B , 269AB ; 5,8-I 225D , 235B ; Dehydro-5,8-I 207E ; 5,6,8-I 209E , 223A (2); 4,6-Q 195C .
Isla Colon, Rocky Bluff, Bocas, Panamá	31	March 2000 5	Major Minor Trace	DHQ <i>cis</i> - 195A . 5,6,8-I 223A , 231B ; Spiro 236 . Deoxy-hPTX 207O ; 5,8-I 205A , 249O ; 5,6,8-I 207C , 231B (2), 237C , 263A , 277E , 293C ; CPQ 247A ; Spiro 252A ; Tri 205B , 247H , 261F ; Unclass 279I , 305H .
Isla Colon, La Gruta, Bocas, Panamá	32a	November 1983 8	Major Minor Trace	None. DHQ 211K , 223Q ; Pip 269C (2). aPTX 253A , 267A ; 5,6,8-I 223A ; Pip 197E , 241G , 267K (2); Tri 223P ; Unclass 211H .
	32b	February 1986 4	Major Minor Trace	None. 3,5-I 195B ; 5,8-I 205A , 207A . HTX 283A , 285A , 285C ; DHQ 269AB ; 5,6,8-I 223A ; 1,4-Q 257D ; Pip 197E , 241D , 267K (2).

	32c	February 1992 10	Major Minor Trace	None. HTX 283A, 285A, 285C ; DHQ 269AB ; 5,8-I 207A (2), 235B ; Pyr 197B ; Unclass 235P . HTX 287A ; Deoxy-PTX 281B ; aPTX 251I ; DHQ 269B ; 3,5-P 223H , 3,5-I 167E, 195B ; 5,8-I 205A (2), 223J, 235B ; Dehydro-5,8-I 221J ; 5,6,8-I 223A ; 4,6-Q 237I ; 1,4-Q 257D ; Izidine 215 ; Pip 241D, 267K (2), 269C ; Spiro 222, 236, 252A .
Isla Colon, North La Gruta, Bocas, Panamá	33	February 1992 28	Major Minor Trace	DHQ 195A . PTX 307A, 323A ; aPTX 267A, 323B ; 3,5-P 223H ; 3,5-I 275C ; 5,8-I 235B . PTX 251D, 277B, 309A ; aPTX 339A ; hPTX 223G ; DHQ 211A ; 5,8-I 205A (2), 251B, 251U ; 5,6,8-I 231B, 237C ; Spiro 236, 252A ; Tri 205B .
Isla Colon, Boca del Drago, Bocas, Panamá	34	February 1986 18	Major Minor Trace	None. PTX 307A ; aPTX 267A, 323B ; DHQ 195A ; 5,8-I 167A, 205A ; 5,6,8-I 223A ; Pip 269C ; Unclass 207GH 211G . PTX 309A, 323A ; 3,5-P 195F ; 5,8-I 203A, 209B ; 5,6,8-I 253H ; 1,4-Q 257D ; Izidine 211B ; Pip 241D, 241G, 267K ; Tri 207GH, 223P ; Unclass 211H .
Isla Cristobal, Bocas, Panamá	35a	October 1981 10	Major Minor Trace	5,6,8-I 223A . PTX 251D ; aPTX 267A ; 3,5-I 195B ; 5,8-I 203A ; 5,6,8-I 231B ; Unclass 241C . aPTX 323B ; 5,8-I 167A ; 5,6,8-I 207C ; Unclass 167C .
	35b	October 1983 20	Major Minor Trace	5,6,8-I 223A . PTX 251D ; aPTX 267A ; DHQ 195A ; 5,8-I 203A ; 5,6,8-I 231B, 263A . 3,5-P 223H ; 5,8-I 207A .
Isla Pastores, Bocas, Panamá	36a	October 1981 10	Major Minor Trace	None. HTX 283A, 285A, 285C ; PTX 251D ; aPTX 267A ; DHQ 219C ; 5,6,8-I 195D, 231B . HTX 287A, 287B ; PTX 309C ; aPTX 323B ; DHQ 195A, 269AB, 293A ; 5,8-I 203A ; 5,6,8-I 209E, 223A ; Unclass 167C, 181C, 207F .
	36b	October 1983 38	Major Minor Trace	None. HTX 285A ; DHQ 269AB ; 5,8-I 209I, 223J ; 5,6,8-I 223A, 231B, 263A . HTX 283A, 285C ; DHQ 269B ; 3,5-P 223H ; 5,8-I 271A ; Dehydro-5,8-I 221J ; 5,6,8-I 275E (2) ; Lehm 275A .
Almirante, Bocas, Panamá	37	November 1983 10	Major Minor Trace	None. PTX 251D ; aPTX 267A ; DHQ 195A ; 3,5-P 223H ; 5,6,8-I 223A . 3,5-P 223B ; 5,8-I 203A ; Tri 207GH .
Ojo de Agua, Bocas, Panamá	38	November 1983 19	Major Minor	None. HTX 283A, 285A, 285C ; PTX 307A ; DHQ 195A, 269AB ; 3,5-I 195B ; 5,8-I 205A (2), 207A, 235B ; 5,6,8-I 231B ; Tri 205B .

			Trace	HTX 287A ; PTX 323A ; aPTX 309D , 323B ; DHQ 269B ; 3,5-I 275C ; 5,8-I 203A , 217B , 233D , 251B (2), 251U , 271A ; 5,6,8-I 195G , 223A , 251M , 267J , 293C , 353B ; Lehm 275A ; Pip 211J , 241D , 267K ; Tri 207GH .
Dos Bocas, Bocas, Panamá	39	April 1980 5	Major Minor	None. HTX 283A , 285A , 285C ; PTX 325B ; aPTX 309D , 323B ; DHQ 269AB ; 5,8-I 207A ; 5,6,8-I 223A , 231B ; 1,4-Q 257D .
			Trace	HTX 287A ; PTX 323A ; DHQ 293A ; 5,8-I 203A ; 4,6-Q 195C ; 1,4-Q 207I ; Pip 241D , 269C ; Unclass 231F , 263B .
Quebrada El Guabo, Bocas, Panamá	40	April 1980 10	Major Minor	None. HTX 283A , 285A , 285C ; PTX 251D , 323A ; aPTX 267A ; 5,8-I 205A ; 5,6,8-I 223A , 231B ; 4,6-Q 195C ; Pip 241D .
			Trace	HTX 287A , 287B ; DHQ 195A , 221B , 269AB ; 5,8-I 167A , 207A , 225D ; 5,6,8-I 209C ; Lehm 275A ; Izidine 291B ; Pyr 183B , 235F ; Pip 269C ; Unclass 153B , 167C , 181C , 207F , 235D , 263B .
Cerro de Piedra Grande, Bocas, Panamá	41	June 1989 6	Major Minor	None. Deoxy-hPTX 193F (2); DHQ 195A ; 3,5-P 223B ; 5,8-I 203A ; 5,6,8-I 223A , 231B .
			Trace	aPTX 241H , 309D ; 3,5-I 195B ; 5,6,8-I 267J ; Pip 239L , 269C ; Tri 207GH (2).
Rio Sand Box, Limon, Costa Rica	42a	June 1989 5	Major Minor	None. HTX 283A , 285A , 285C ; DHQ 269AB ; 5,8-I 203A , 207A .
			Trace	PTX 307A ; aPTX 241H , 323B ; Deoxy-hPTX 207O ; DHQ 219A , 223F ; 3,5-P 223H ; 3,5-I 195B , 223AB ; Dehydro-5,8-I 201A ; 5,6,8-I 231B ; Pyr 197B , 225C ; Pip 269C ; Spiro 151B , 236 ; Tri 207GH (2).
	42b	June 1990 30	Major Minor	HTX 283A , 285A , 285C ; 5,6,8-I 223A , 231B . HTX 287A ; DHQ 269A , 269AB ; 3,5-P 223H (2); 3,5-I 195B , 275C ; 5,6,8-I 249C , 259C , 267J ; Lehm 275A ; Pyr 197B ; Tri 207GH (2).
			Trace	PTX 323A ; Deoxy-PTX 281B ; aPTX 323B ; DHQ 195A , 211A , 223F , 271D , 275B ; 5,6,8-I 263A ; Lehm 277A ; Pyr 183B ; Pip 239L ; Unclass 271C .
W Bribrí, Limon, Costa Rica	43	June 1990 5	Major Minor	None. HTX 283A , 285A , 285C ; aPTX 241H ; 3,5-P 223H ; 3,5-I 195B (2); 5,8-I 203A , 205A ; 5,6,8-I 223A ; Tri 207GH .
			Trace	aPTX 309D , 323B ; DHQ 195A ; 5,6,8-I 195G , 259C , 263A , 267J ; Izidine 223E ; Pyr 197B ; Pip 241D .
Carbón, Limon, Costa Rica	44	June 1990 4	Major Minor	HTX 283A , 285A , 285C ; DHQ 269AB ; 5,6,8-I 223A (2); Pyr 225H . Deoxy-hPTX 193F ; DHQ 275B (2); 3,5-P 251K ; 3,5-I 195B , 275C ; 5,6,8-I 231B , 249C , 259C ; Lehm 275A ; Tri 207K .
			Trace	PTX 309C ; DHQ 195A , 269B , 271D ; 3,5-P 223H ; 3,5-I 223R ; 5,8-I 203A , 263F , 271A ;

5,6,8-I **251M**, **263A**, **267J**, **277E** (2); Lehm **277A**; Pyr **225C**; Tri **207GH**, **221G**.

Amubri, Limon, Costa Rica	45	May 1995 7	Major Minor Trace	None. aPTX 267A ; 3,5-P 223B ; 3,5-I 195B ; 5,8-I 203A , 205A (2), 207A (2), 235B ; Dehydro-5,8-I 201A ; 5,6,8-I 231B (2); Pyr 197B ; Pip 241D . HTX 291A ; DHQ 275B ; 3,5-P 249I , 251K ; 3,5-I 275C ; 5,8-I 223D ; 5,6,8-I 223A , 267J ; Lehm 275A ; Pip 239O , 267K ; Unclass 235P , 291I .
Cahuita, Limon, Costa Rica	46	May 1995 2	Major Minor Trace	DHQ 269AB . HTX 283A , 285A , 285C ; aPTX 323B ; Deoxy-hPTX 193F ; 5,8-I 203A (2), 261D , 263F ; 5,6,8-I 223A ; Lehm 275A , 293F ; Pyr 225H ; Pip 267K . HTX 287A ; PTX 307A , 323A ; aPTX 267A ; hPTX 223G ; DHQ 269B , 275B ; 5,6,8-I 231B , 263A , 293C ; 1,4-Q 263H , 277H ; Pip 239L , 241D ; Tri 205E ; Unclass 267I .
Río Chitaría, Limon, Costa Rica	47	June 1990 3	Major Minor Trace	HTX 283A , 285A ; DHQ 269A , 269B , 275B (2); 3,5-P 251K (2); 3,5-I 275C (2). HTX 285C ; DHQ 269AB , 269B , 271D ; 3,5-P 223H (2); 5,6,8-I 223A , 263A , 277E ; Pyr 253I , 279G . 5,8-I 209I , 243B ; 5,6,8-I 275E ; Pip 241D ; Unclass 209G .
28 Millas, Limon, Costa Rica	48a	June 1990 3	Major Minor Trace	aPTX 309D ; 5,6,8-I 223A , 263A (2), 293C (2). aPTX 323B ; 3,5-I 195B ; 5,8-I 271A (2); Dehydro-5,8-I 269D ; 5,6,8-I 277E (2); Pyr 197B . PTX 237A ; 5,8-I 207A ; 5,6,8-I 275E (2); 1,4-Q 217A ; Pyr 253I .
	48b	May 1995 5	Major Minor Trace	None. aPTX 323B ; 3,5-P 223H (2), 251K ; 3,5-I 195B ; 5,8-I 205A (2), 235B , 271A ; 5,6,8-I 263A , 279F , 293C (2); Pyr 197B ; Pip 241D , 241G . HTX 285A ; aPTX 253A ; DHQ 269AB ; 5,8-I 203A ; 5,6,8-I 275E , 277E ; Lehm 275A , 293F ; Izidine 223I , 225G ; Pyr 225H ; Pip 211I , 225I , 237J , 239L , 253J , 267K ; Spiro 151B , 222 , 236 ; Unclass 209G .
Siquierres, Limon, Costa Rica	49	May 1995 5	Major Minor Trace	PTX 307A . PTX 307B , 323A ; aPTX 325A ; DHQ 269AB ; 3,5-I 195B ; 5,8-I 235B , 251B , 251U ; Tri 205B . HTX 285A , 291A ; PTX 251D , 277B ; aPTX 267A ; DHQ 195A ; Dehydro-5,8-I 233E ; 5,6,8-I 293C ; Pip 211J ; Spiro 151B , 236 ; Unclass 211H .
Pocora, Hotel Las Palmas, Limon, Costa Rica	50	May 1995 5	Major Minor Trace	None. HTX 285A , 285C , 287A , 291A ; PTX 323A ; aPTX 253A ; DHQ 195A , 269AB ; 3,5-P 251K (2); 3,5-I 195B (2); 5,8-I 195I , 231C (2); 5,6,8-I 223A ; Pip 239O ; Spiro 236 , 252A . HTX 285B , 287B ; PTX 209F ; DHQ 211A , 269B ; 3,5-P 223H (2), 251O , 265J (2); 3,5-I 223AB (2), 275C ; 5,8-I 203A , 205A , 207A (2), 217B , 237D , 261D ; 5,6,8-I 231B , 263A ; Lehm 275A ; Izidine 155 ; Pip 225I ; Spiro 151B .

Tortuguero, Heredia, Costa Rica	51	December 1988 5	Major Minor Trace	None. aPTX 341A ; 5,8-I 205A , 207A ; Pip 241D . PTX 323A ; aPTX 267A ; DHQ 219A ; 3,5-P 195F ; 5,8-I 247E ; 5,6,8-I 195G , 209C , 223A , 251T ; Izidine 291B ; Pyr 197B ; Pip 239L ; Tri 253S ; Unclass 207F , 209G .
Near La Selva Biological Station, Heredia, Costa Rica	52	January 1984 10	Major Minor Trace	HTX 291A . 5,8-I 207A . 3,5-I 275C ; 5,8-I 195I , 205A , 209I , 271A , 275F .
Río Sarapiquí, Heredia, Costa Rica	53	June 1989 6	Major Minor Trace	None. HTX 291A ; 3,5-I 195B ; 5,8-I 195I , 205A (3); Pyr 197B . HTX 285B ; DHQ 269AB , 275B ; 3,5-P 223H , 251K ; 3,5-I 275C ; 5,6,8-I 223A ; 1,4-Q 257D , 279E ; Izidine 265C ; Pip 241D ; Spiro 222 , 236 ; Unclass 211H .