Predator Prey Detection

Predater

- 1 Probability of detection of pay that has not moved.
- @ Probability of detection of prey that has imitated accept given distance hom predater.
- 3 Subsequent remeter by predater guen a prey - detecten :- dependent on detecten strength?

Prey

- @ Probability Hat prey detects approach of predator and initiates merement.
- @ distance at which merepoint is

Summenten of above events wice and to following outcome events.

- O Prey not detected a) no movement b) menement by prey.
- @ Prey detected and captured a) and b) above.
- 3 Prey detected and not comptened given escape by prey.
 - a) without attack and a,r.s.
 - b) with attack and aire.

Dator anandable Arm ald trucks

- 1 Frequency of coupture without prey neverent.
- 3 Distances at which prey instate escape behavier + directors
- @ Guen a merenent by prey and distance him predater whether this coused change in truck parameters.
- ⊕ Frequency of A1 → A3, P and conditions, and
 subsequent below of predator.

8th april 85

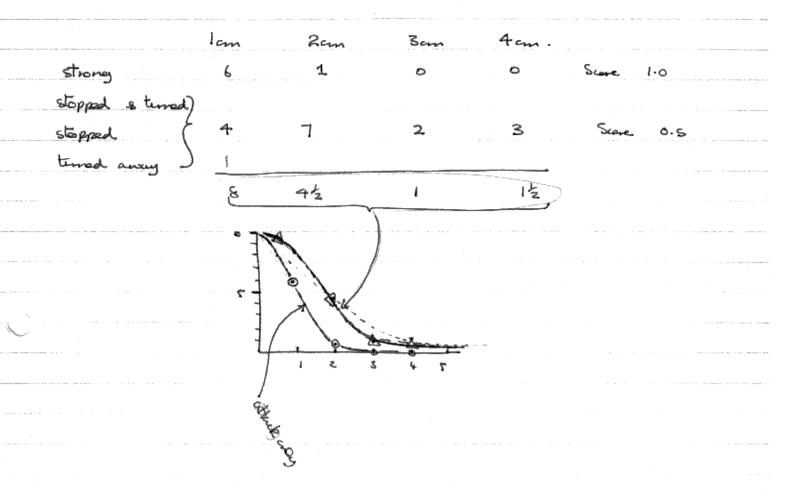
Precummany test of reactive distance. Used smoot stick and prodded sand gentley at 45° to director of smoot

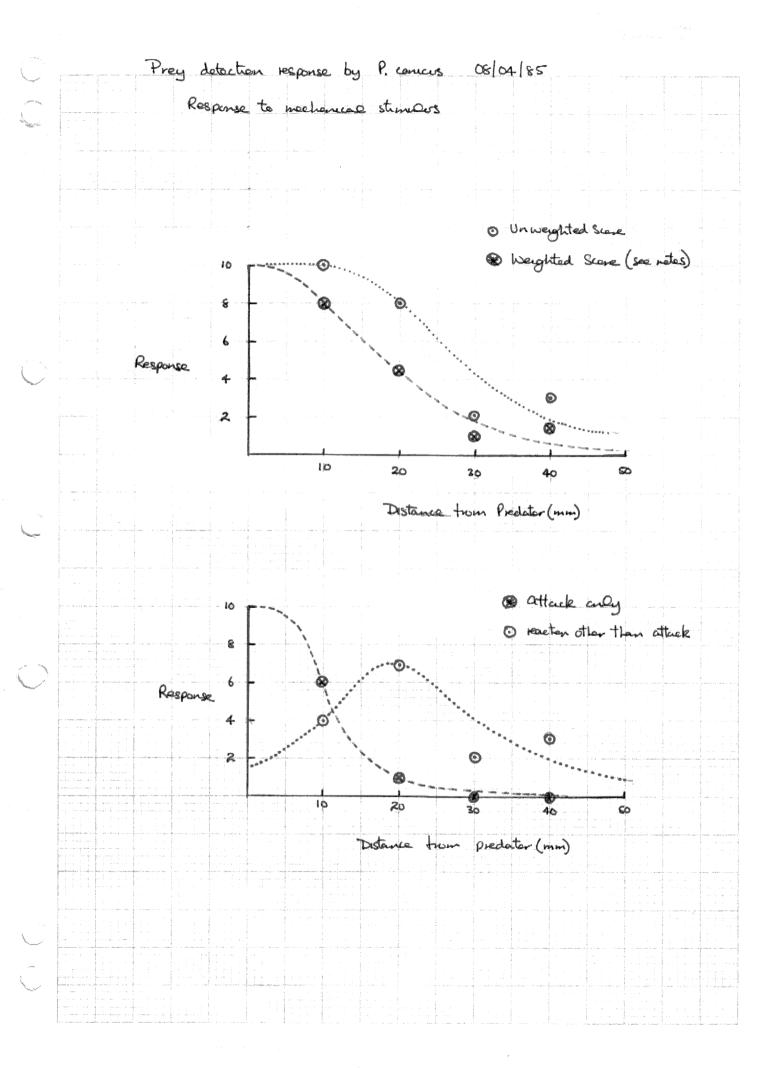
ie



lan	Zan
1 > strong recret	1
2 7 "	2 ? Indoprate
3 ~ "	3 V stopped turn & A
4 ~ *	4 ~ - " -
5 7 *	5 & stopped but cont an
6 & turned curry	6 V sterpped & turned
7 & stopped	7 & stopped but cent an
8 v strong	8 x no reaction
9 x	9 V stopped a no litter react
10 x trind away	10 V turned stepped & cent con.

Ben	4cm
1 X no peacet	1 x
2 ? pers tem towards	2 ? tun toward
3 V seme react	3 ? stepped
4 V turned & principled	4 ? stopped
5 x	S X
6 x	6 x
7 ×	7 x
8 X	& X
9 ×	9 X
lo X	10 ? tim?





Prey detection and escape from Polinices sp by Isanda coronata

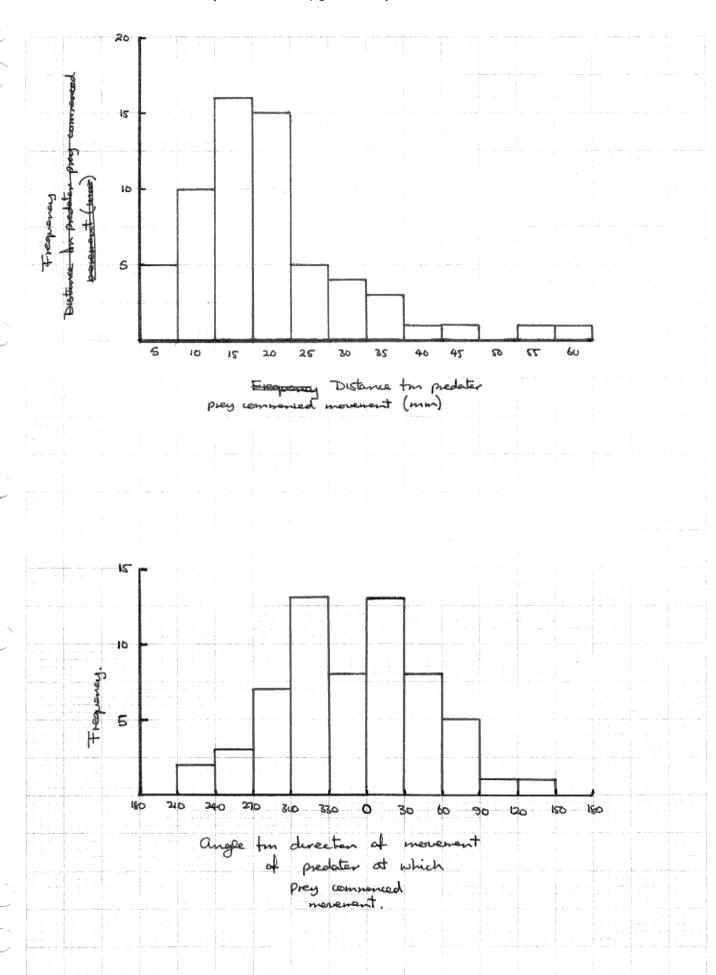
KEY

Data obtained from all tracks where start of prey movement clearly recorded with respect to predators position. Re-encounters between the same prey item and predator are not included.

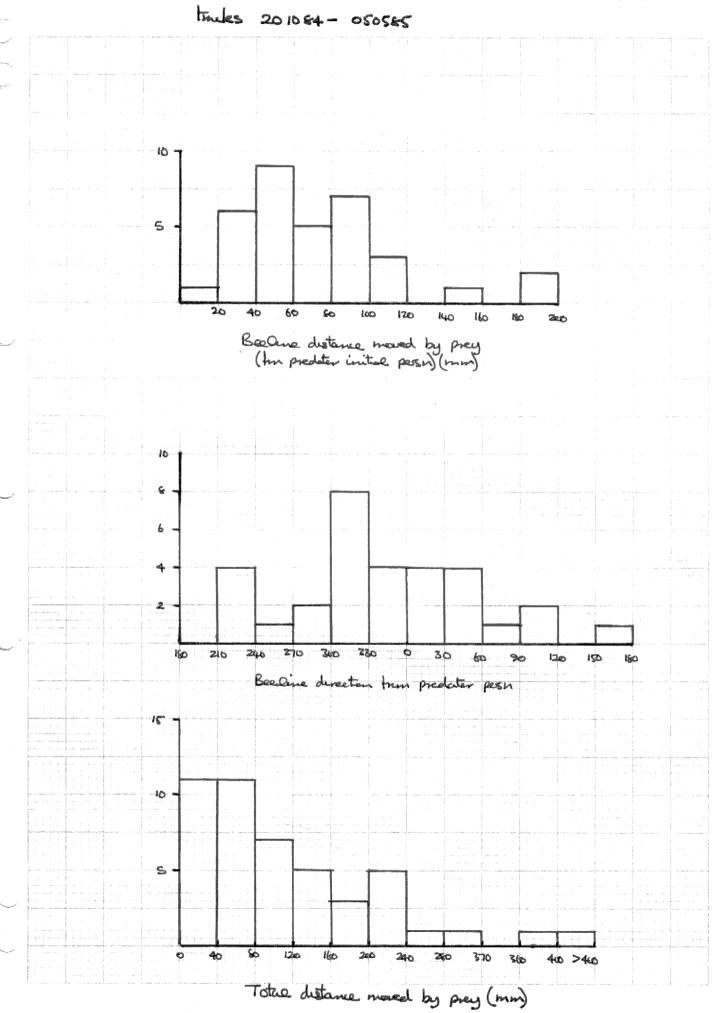
****** ****** ******	
DATE	date of track
TS	time track started
I Par	time track finished
PPL	predator prey location
TF	track position
D1	distance from predator prey commenced moving (mm)
A1	angle from direction of movement of predator
B1	beeline distance from predator position to end of prey track
B2	beeline direction " " " " " " " " " " " " " " " " " " "
T 1	total distance moved by prey
T2	total time taken to move Ti
DS	depth of search by predator
PD	possible detection of prey by predator
PS	prey speed overall T1/T2

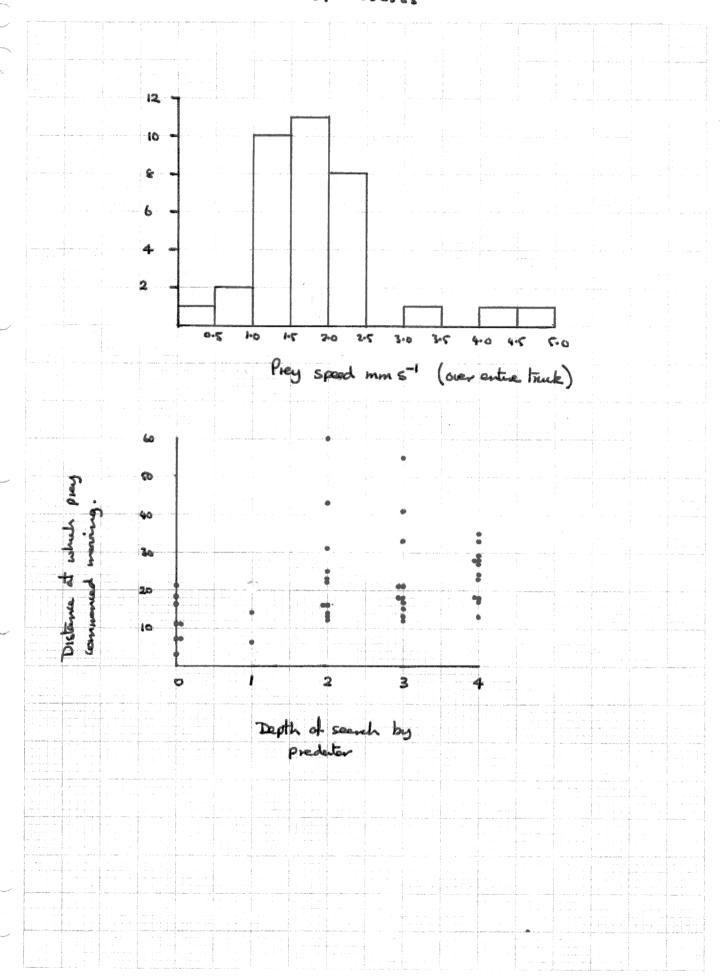
DATE	TS	1	FFL	17 [44	D1	A1	B1	BZ	T 1	T2	DS	F.D	F'S
water death taken that these state to	SEN SOUND STEEL CARDA SENIS FO	POT CERTY CORDS JURIS DUTTS ALONS THY CERTY COURT COURT SERVE	tises cides enter inside cased were serve essue nodes serve	codis store succe south some	Meste assis sesso scare	seent week midde women vegay later passi strick which essen	meder syste rando upper siste	NAMES AND TAXABLE AND ADDRESS OF TAXABLE AND		THE STEEL LAND GROW REST OF	EE 48807 12020 22509 CSBSS 10 17777 18037 82507 CSBSS	100E 100E 100E 100E 1	ACTUAL COURT STATE SCARS
com 4 caco a	1010	4 4 (%)(%)	4 4 4	4 277, 278,	4.4	401ga 2719a 279ga		-4				D)	
201084	1010	1100	111	122	11	353	-1	-1	1]	I	Ø	erre: -
221084	1145	1155	111	11		68	***** 1	1	1	-1	-1	1	1
241084	1253	1309	111	1.7	12	312	1	***** 1	· 1	1	1	1.	1
061184	1353	1401	112	1.3	21	1 1	42	349	24	1	1	1	1
061184	1304	1332	112	93	33	30	1	1	-1	1	4	(2)	1
061184	1304	1332	112	95	23	354	1	1	1	1	4	Ø	1
061184	1304		112	97	18	4	1	-1	1	1	4	(2)	···· 1
061184	1114	1126	112	30	11	113	mm 4		1	1	1	1	1
091184	1532	1546	112	51	28	22	1	1	1	1	53	0	1
091184	1532	1546	112	26	11	309	1	-1	1		···· 1	1	1.
101184	1,453	1515	112		22	317	26	230	44	1	500	1	1
101184	1453	1515	112	3	16	32	110	309	155	-1	-1	1	1
101184	1453	1515	112	39	22	48	56	37	46	1	2	1	-1
101184	1453	1515	112	46	55	enge soge	97	327	218	···· 1	erege east	1	···· 1
101184	1453	1515	112	58	60	76	1	-1	-1	1	2	Ø	1
101184	1453	1515	112	63	16	42	-1	1	1	1	Jung Jung	Ø	-1
101184	1453	1515	112	1	29	329	43	1.6	34	<u>1</u>	4	(2)	1
101184	1453	1515	112	1,	28	46	64	Ent star	38	1	4	Ø	1
101184	1453	1515	112	1	17	Ø	40	340	49	1	4	(2)	1
111184	1024	1039	112	4	1	12	-1	-1	-1	1	(2)	1	1

DATE	75	TF	PPL	TP	DI	Ai	61	62	TI	72	26	PD	PS
111184	1024	1039	112	33	16	355	10001 45	1	1		-1	1	1
220285	1418	1429	112	32	12	284	97	331	177	1	2	1	1,
140385	1314	1331	112	36	1.3	348	-1	-1	1	···· 1	4	1	<u>1</u>
140385	1314	1331	112	39	14	50	1	1	1	-1	<u></u>	Ø	1
150385	0901	0928	112	14	18	350	46	89	200	J	erge.	1	1
150385	1108	1134	112	1	13	(2)	1	1	1	1	1	1	1
150385	1219	1310	112	1	-1	-1	198	1	298	135	1	1	2.2
150385	1219	1310	112	58	18	324	1	1	106	75	1	1	1.4
150385	1219	1310	112	72	12	4(2)	66	118	71	60	n enda	1	1.2
150385	1219	1310	112	143	18	349	15	224	53	30	4	1	1.8
150385	0927	0940	112	14	18	87	107	326	134	1	1	1	-1
160385	1231	1303	112	Total State	16	324	-1	1	50	30	(2)	1.	1.7
160385	1231	1303	112	58	11	288	61	177	73	60	(2)	1	1.2
160385	1151	1203	112	1, Ø	24	303	51	341	40	90	4	0	0.4
160385	1216	1221	112	1	11	-1	26	4	29	15	-1	1	1.9
160385	1205	1212	112	14	35	303	50	299	15	15	4	Ø	1.0
030485	1238	1243	111	16	25	134	1	-1	104	45	2	(2)	2.3
030485	1214	1226	111	38	8	290	1	1	262	60	-1	1	4.4
030485	1248	1259	111	34	19	316	-1	1	183	90	1	1	2.0
050485	1214	1236	111	33	16	339	1	-1	480	225	2	1.	2.1
040485	1150	1204	111	24	31	271	***************************************	1	15	15	and,	1	1.0
060485	1336	1409	111	76	1	330	-1	1	57	75	,	1	0.8
060485	1336	1409	111	117	43	305	31	20	48	15	P des	(2)	20 m dia
060485	1246	1256	111	13	13	(2)	1		211	45	···· }	1	4.7
070485	1332	1346	111	31	13	81	27	34	173.173 dia dia	15	2	1	1.5
010585	1208	1220	111	19	6	237	87	233	120	75	1	1	1.6
010585	1121	1132	211	4	7	286	80	220	231	180	(2)	Ø	1.3
010585	1133	1141	211		1.1	24	1	1,	380	210	Ø	Ø	1.8
7 010585	1133	1141	211	6	7	240	1	1	-1	1	(2)	Ø	10000
030585	1215	1222	211	19	21	227	52	<u></u>	78	60	.5	1.	1.3
630282	1242	1256	211	43		302	92	289	84	45	anga Val	Ø	1.9
040585	1247	1303	111	54	18	87	1	1	32	45		1	0.7
040585	1247	1303	111	12	27	309	181	And they are	162	105	4	1	1.5
040585	1216	1234	111	65 .S	18	249	23		39	30	1	1	1.3
0 4 0 585	1147	1153	111	3	21	229	118	320	123	75	Ø	(2)	1.6
040585	1321	1345	111	76	15	12	88	35	90	75	3	1	1.2
		1344	111	15	17	9	151	18	148	75	3	1	2.0
050585		1344	111	1.4	16	6	55	317	204	120	- 1	1	1.7
050585	1250	1259	111	17	21	28	74	354	60	30	3	Ø	2.0
050585	1232	1238	111	6	18	275	32	240	20	15	Ø	(2)	1.3
0 50585	1232	1238	111	10	41	316	69	305	31	15	72.	(2)	2.1
050585	1301	1324	111	80	13	28	82	93	109	45	1	Ø	2.4
050585	1301	1324	111	87	20	320	1	1	105	60	1	(2)	1.7



Escape resperse by Isunda conventa





TATTACK . DAT

Date	Pred sp	Fred Size	Prey sp	Prey size	Captured	Tine
20/04/85		11.17	1	3.17	Ø	38.4
20/04/85	2	11.17	-2 -1.	3.9Ø	1	105.2
20/04/85	eng.	11.05	1	2.65	Ø	15.0*
20/04/85	2	13.45	1	2.64	(2)	28.4
20/04/85		13.45	1.	3.95	1	83.6
20/04/85	,,,,,,	13.45	1.	2.42	<i>E</i>	39.0
20/04/85	1.	9.05	1	and the same	Ø	42.0
20/04/85	1.	9. 0 5	1.	2.12	1	40.2
20/04/85	1	9.05	1	3.47 .	2	50.2
20/04/85	1	7.83	*** ****	2.69	Ø	18.9
20/04/85	1.	7.83	1	3.90	1	32.0
20/04/85	1	8.76	1	3.35	Ø	33.2
20/04/85	1	8.76	1.	2.30	1	26.2
20/04/85	1.	8.76	1.	3.64		39.2
20/04/85	1	10.18	1	3.36	1	38.2
20/04/85		9.81	1	3.43	Ø	68.6
20/04/85	4	9.81	1	3.24	1.	48.8
15/05/85	1	7.40	1	3.75	Ø	63.6
15/05/85	1	9.10	1	4.16	Ø	40.6
15/05/85	1	6.55	1	3.5	Ø	64.2
15/05/85	1	10.00	1	3.23	Ø	64.4
15/05/85	1	9.70	1	3.69	Ø	39.6
15/05/85	1	8.40	1	3.36	Ø	42.2
15/05/85	1 .	6.86	1	3.36	(2)	44.0 83.8
15/05/85	1	7.91	4	4.11	Ø	46.8
16/05/85 16/05/85	1	7.41 10.41	4	3.71 3.16	Ø Ø	82.6
16/05/85	1	8.30	1	4.84	(2)	35.6
16/05/85	1	10.18	4	3.36	Ø	29.2
16/05/85	1	8.42	J.		(2)	40.2
16/05/85	1	8.47	1	3.05	Ø	46.2
16/05/85		7.56	1	2.75	Ø	36.8
16/05/85	1	7.02	1	3.31	Ø	30.4
16/05/85	1	9.25	1	3.58	Ø	49.8
16/05/85	1	10.82	1		Ø	65.Ø
16/05/85	1	9.31	45. 18.	5.24	Ø	33.4
16/05/85	1	10.62	1	4.62	Ø	29.6
16/05/85	1	8.86	1	3.12	Ø	49.0
16/05/85	1	10.34	1.	4.3	Ø	36.8
16/05/85	1	6.0	1	3.95	(2)	103.0
16/05/85	1	8.4	1	4.25	Ø	71.0
16/05/85	1	8.8	1	3.76	Ø	69.2
16/05/85	1	7.08	1	congress surger group	Ø	40.8
16/05/85	1	7.45	1	2.66	Ø	46.6
16/05/85	1	8.Ø	1	2.67	Ø	47.0

Notes:

Pred species

1. P. conicus 2. P. sordidus 3. P. incei

Prey species

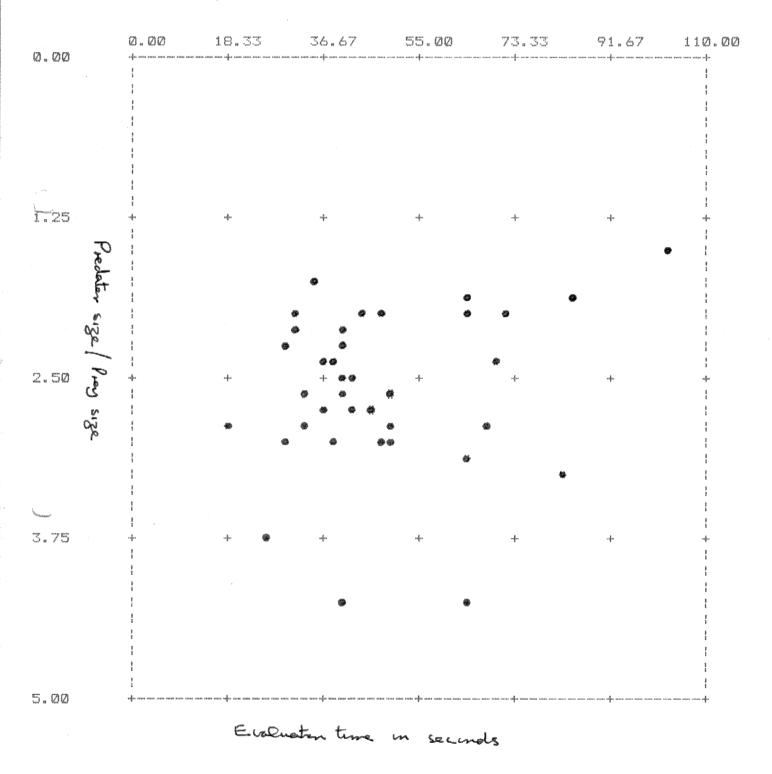
1. Isanda coronata 2. Mesodesma alternata

ID: EVALUATION TIME P. conicus Date: 16/5/85

DY = 1.83333

COLLISION SYMBOL: #

FILES: ATTACK4.DAT(1,4)=*



apparently no relationship between prey - pred size and

Marcoola beach surf club 17/06/85. Pipi Escape response.

over sand		burro	wing	beeline		
Dir	Dist(mm)	Dir	Dist(mm)	Dir	Dist(mm)	
***** **** ***** ***** ***** ****	79 04444 4444 48444 48444 48444 48444 48444 48444 48444	ather distin whese admir chidis asser	a příbla kátát (senic ceáda (diská memil memor nedec come come			
300	41	19090	9008	èces	disdu	
238	106	*****	yeare	Seesa	40.866	
220	123	cessor	wites	*1016	94X34	
188	ورده الله الله	244	26	213	Breed Total	
358	36	321	38	338	70	
242	37	252	26	246	62	
015	74	******	manual services	******	www.e	
189	58	08899	12449	44604	andhir	
333	138	- Tables	10000	V800#	49440	
208	48	193	26	231	62	
178	65	80014	intere	******	*****	
212	58	251	38	227	91	

Marcoola beach surf club 18/06/85. Measurement of Pipi escape response elicited by overflying jet aircraft.

over	sand	burrc	wing	beel	beeline		
Dir	Dist(mm)	Dir	Dist(mm)	Dir	Dist(mm)		
****** ***** ***** ***** ***** ***		***** ***** ***** ***** ****					
165	27	240	2	169	20		
118	62	54	7	112	66		
273	56	200	8	266	59		
84	group group group	mate.		*****	waser		
238	98	*****	****	www.	many ·		
82	82	148	27	92	95		
290	72	247	only may	275	102		
106	1.10	154	8	111	119		
233	la Ca	121	8	221	58		
83	91	Magnet	4000	49904	0.664		
186	42	146	ديد. د.	169	71		
277	72	291	9	279	81		
344	85	330	6	343	90		
303	1.04	288	34	299	137		
359	78	301	7	355	81		

Sizes of pipi's measured

^{7.46}

^{10.03}

^{8.55}

^{5.44}

^{7.30}

^{7.71}

^{8.75}

^{8.64}

^{7.58}

^{6.69}

^{10.48}

^{10.71}

10.28 7.74 17.38

n=15

Mean=8.95 s.d.=2.76

Escape response of pipi's to incoming aircraft 19/06/85.

over	sand	burro	wing	beel	ine
Dir	Dist(mm)	Dir	Dist(mm)	Dir	Dist(mm)
269	125	119	24		4 75 7
226	98	287	6	261 229	106
171	112	208	ETT.	172	1Ø1 116
345	146	256	9	341	146
143	95	33	8	135	91
.38	128	150	10	43	125
192	83	CASEA	#29%X	1888	vite silvani basal
10	108	131	44	33	92
348	124	86	45	9	27
352	83	82	See 2	356	84
334	56	60	8	342	57
196	39	93	42	141	52
338	64	1.0	3	339	67
116	120	310	24	112	97
209	75	236	17	213	90
62	150	318	48	45	148
230	49	320	25	257	56
110	102	-3	18	100	97

Sizes of pipi's measured.

9.46

8.25

9.44

7.24 7.15

9.04

9.88

6.70

6.06

5.28

8.76

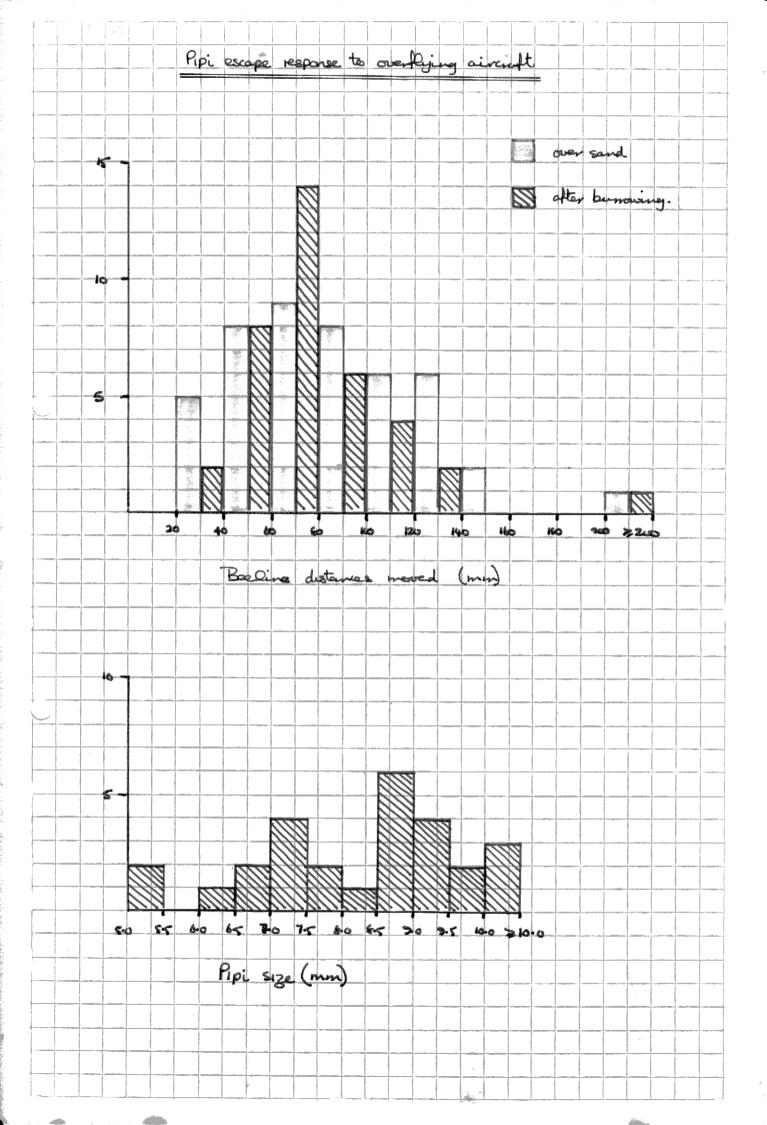
8.64

9.80

9.06

8.72

Mean=8.23 s.d.=1.42 n=15



PIDI escape response 170685 ODD = artitlery.

 over sa	nd	below so	und	bee Di	ve.	
 DIR(0)	DIST (mm)	DIR(°)	DIST (mm)	DIR (0)	DIST (mm)	
300	41	-	- Modeling	1000		
238	106	_		_		- 10.0 d - 100d
220	123	_	~		₀	
188	33	244	26	213	53	
358	36	321	38	338-	70	
242	37	252	26	246	62	
015	74.	-	_		_	
<i>e</i> 31	58	_	_	-	-	
332	138	_		-		
208	48	193	26	231	62	
178	65		_		g.com	
212	28	321	38	227	91	
		·				
	7					
			•			
	,*		•			

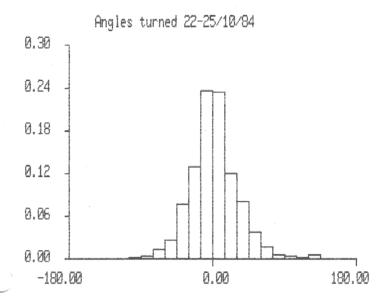
Pipi escape response 180685 ppp = arbitary

over sand			below	sand	boelii	~Q_		
	DIR	DIST	DIR	DIST	DIR	DIST		
	165	27	240	2	169	28	o con en a la recentifica	
	118	62	054	7	112	66		
	273	56	200	8	266	59		
	084	222		-	_	_		
	238	98	_	-	distri			
	082	82	148	27	092	95		
	290	72	247	37	275	102		
	106	110	154	8	111	119		
	233	62	121	હ	221	58		
	o&3	91	-		-	-		
	186	42	146	33	169	71		
	277	72	291	9	279	81		
	344	85	330	6	343	90		
	303	104	288	34-	299	137		
	359	78	301	7	355	81		

PIPI 0800 pe response 190685

Sea = $\phi\phi\phi$

over sa	nd	below s	and	bea.li	ne.	
 DIR	DIST(mm)	DIR	DIST (mm)	DIR	DIST (mm)	
269	125	119	24	261	106	nn page - no nga kano no na nina angalakanaka
226	98	287	6	229	101	
171	112	208	5	172	116	
345	146	256.5	9	341.5	146	
143.5	26	033	8	135.5	91	al .
038	128	150	10	043	125	
192	83	-	-	-		
010	108	131	44	<i>⊙</i> 33·2.	52	
348	124	⊳ €6	45	009	127	
352	83	082.5	5	326	€4	
334	56	060	8	34-2	57	
196	39	0∋ 3	42	141	S2.	
338	64	010	3	GE E	67	
116	120	310	24	112	97	
209	75	236	17	213	90	
062	150	318	48	045	14-8	and the second second second second second second
230	49	320	25	257	56	
110	102	003	18	100	97.	
•						



No. of data points 534 Size class width 15.

5	ize Clas	55	Freq(%)	Size Clas	55	Freq(%)	Size Clas	5	Freq(%)
	-172.50	10 00	0.00	-157.50	51 10	0.00	-142.50	83 36	0.00
	-127.50	n	0.00	-112.50	11 11	0.00	-97.50	n n	0.18
	-82.50	11 21	0.37	-67.50	25	1.32	-52.50	85. 88	2.64
	-37.50	68 58	7.73	-22.50	88 \$8	13.01	-7.50	\$8 29	23.77
	7.50	u n	The said of the sa	22.50	11	12.07	37.50	12	8.11
	52.50	12 20	3.77	67 . 50	13 81	1.69	82.50	88. 98	0.54
	97.50	86. 86	0.37	112.50	85 89	0.18	127.50	lib dri	0.56
	142.50	54 18	0.00	157.50	86 (8	0.00	172.50	es șt	0.00

Normal statistics

Mean = 22.47 N = 530

Varience = 412.56

Std. Dev = 20.31

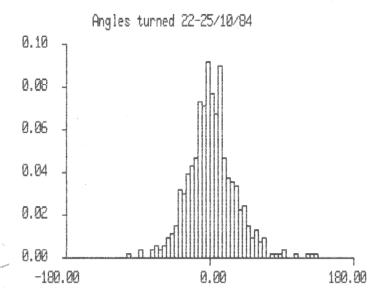
Proportion of +ve turns = 0.5094

Circular Statistics

Mean Angle = 1.67 N = 530

Directionality = 0.87

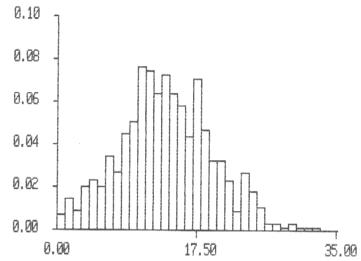
Angular Deviation = 29.56



No. of data points 534 Size class width 5.

Size Clas	5 55	Freq(%)	Size Clas	靈	Freq(%)	Size Clas	. ⊞.	Freq(%)
-177.50	27 88	0.00	-172.50	86 80	0.00	-167.50	K H	0.00
-162.50	12 23	0.00	-157.50	n n	0.00	152.50	M M	0.00
-147.5Ø	25 38	0.00	-142.50	88 88	0.00	-137.50	15 25	\emptyset , \emptyset
-132.50	# 17	0.01	-127.50	76	0.02	-122.50	18 13	0.04
-117.50	25 52	0.04	-112.50	E H	0.02	-107.50	35 85	0.01
-102.50	EE SĀ	0.19	-97.50	:	0.00	-92.50	15 25	0.00
-87.50	M es	0.37	-82.50	51 51	0.00	-77.50	88	0.00
-72.50	88 55	0.37	-67 . 50	25 29	0.56	-62.50	15	0.37
-57.50	19 19	0.56	-52.50	99 EE	0.94	-47.50	17	1.13
-42.50	er II	1.50	-37.50	35 61	3.20	-32.50	u n	3.01
-27.50	12 26	3.96	-22.50	32 6r	4,33	-17.50	15 65	4.71
-12.50	\$H	7.35	-7.50	11 11	7.16	-2.50	85 21	9.24
2.50	35 12	7.73	7.50	n n	6.79	12.50	n n	9.05
17.50	15 25	4.71	22.50	त ध	3.77	27.50	SZ Filk	3.58
32.50	EL M	3.39	37.50	EE EE	2.26	42.50	28. 16	2.45
47.50	19	1.50	52.50	ti ti	0.94	57.50	si tt	1.52
62.50	ES ES	0.75	67.50	W E	0.94	72.50	12	0.00
77.50	n	0.18	82.50	a a	0.18	87.50	11 12	0.18
92.50	16 13	0.37	97.50	33. 29	0.00	102.50	18. 87	0.00
107.50	\$£ \$8	0.18	112.50	20	0.00	117.50	er er	0.00
122.50	N E	0.18	127.50	85 18	0.18	132.50	E E	0.18
137.50	85 58	0.00	142.50	14	0.00	147.50	68 08	0.00
152.50	in N	0.00	157.50	16 10	0.00	162.50	51 11	0.00
167.50	10	0.00	172.50	22	0.00	177.50	22	0.00





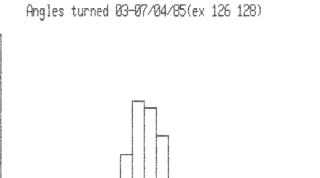
No. of data points 548 Size class width 1.

Size Clas	5 (5)	Freq(%)	Size Clas	5	Freq(%)	Size Class	Freq(%)
0.50	56 66	0.72	1.50	16 10	1.45	2.50 :	0.91
3.50	\$2 23	2.00	4.50	= it	2.37	5.50 s	2.00
6.50	朝	3.46	7.50	53. 89	2.73	8.50:	4.56
9.50	58 86	5.10	10.50	19	7.66	11.50 :	7.48
12.50	Ni E	6.38	13.50	916 28	7.29	14.50 :	6.38
15.50	ii ii	5.83	16.50	3E 22	4.37	17.50	7.11
18.50	82 84	4.74	19.50	IX Jis	3.28	20.50 :	3.28
21.50	## ##	2.37	22.50	ex ex	0.91	23.50 :	2.73
24.50	42 14	1.82	25.50	n n	1.09	26.50 :	0.36
27.50	52 26	0.36	28.50	23 22	0.18	29.5Ø :	0.36
30.50	28 8)	0.18	31.50	25 28	0.18	32.50 :	0.18
33.50	14. 17	0.00	34.50	91 66	0.00		

Normal statistics

Mean = 13.69 N = 548

Varience = 34.07 Std. Dev = 5.83



0.00

No. of data points 540 Size class width 15.

Size Clas	E	Freq(%)	Size Clas	; =	Freq(%)	Size Clas	, CC.	Freq(%)
-172.50	ii ii	0.00	-157.50	28 23	0.00	-142.50	ts ss	0.19
-127.50	n n	0.00	-112.50	31 88	0.00	-97.50	H B	0.00
-82.50	S B	0.77	-67.50	E	1.92	-52.50	58 56	2.89
-37.50	jú 38	6.55	-22.50	ä	13.29	-7.50	59 16	20.80
7.50	H H	19.84	22.50	15	15.79	37.50	36 26	9.44
52.50	TH SE	4.04	67.50	27 28	2.31	82.50	66 65	1.34
97.50	H H	Ø.57	112.50	n n	0.00	127.50	SA Au	0.00
142.50	an 60	0.00	157.50	86 80	0.19	172.50	68 56	0.00

180.00

Normal statistics

0.30

0.24

0.18

0.12

0.06

0.00

-180.00

Mean = 24.32 N = 519

Varience = 454.41

Std. Dev = 21.31

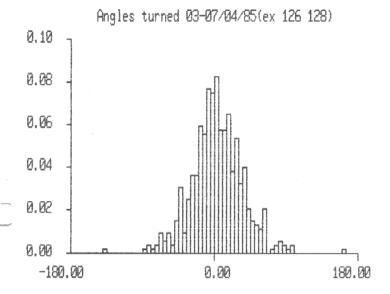
Proportion of +ve turns = 0.5356

Circular Statistics

Mean Angle = 3.23 N = 519

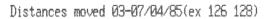
Directionality = 0.86

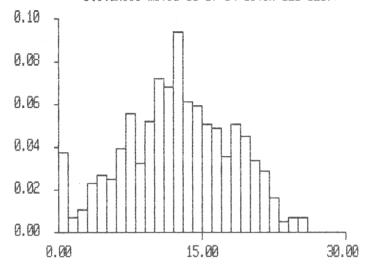
Angular Deviation = 31.46



No. of data points 540 Size class width 5.

Size Clas	55	Freq(%)	Size Clas	: 55	Freq(%)	Size Class	Freq(%)
-177.50	n	0.00	-172.50	55 55	0.00	-167.50 :	0.00
-162.50	26 EQ	0.00	-157.50	22	0.00	-152.50 :	0.00
-147.50	N E	0.00	-142.50	88	0.00	-137.50 :	0.19
-132.50	N M	0.01	-127.50	26 08	0.02	-122.50 :	0.04
-117.50	EL Sk	0.03	-112.50	in tr	0.03	-107.50 :	0.01
-102.50	82 88	0.00	-97.50	n n	0.00	-92.50 :	0.00
-87.5Ø	90 90	0.19	-82.50	EL Si	0.38	-77.50 s	Ø.19
-72.50	88 87	Ø.38	-67.50	## (9	0.96	-62.50 :	0.57
-57.50	85 88	0.96	-52.50	N El	0.38	-47.50 :	1.54
-42.50	ts si	3.08	-37,50	u u	0.96	-32.50 :	2.50
-27.50	20 00	3.66	-22.50	H H	3.66	-17.50 :	5.97
-12.50	es es	5.58		EE.	7.70		7.51
2.50	68 22	8.28	7.50	22 54	5.78	12.50 :	5.78
17.50	18 81	6.55	22.50	și M	3.85	27.50 :	5.39
32.50	58 66	3.27	37.50	11	4.04	42.50 :	2.11
47.50	18 83	1.54	52.50	id es	1.34	57.50 :	1.15
62.50	<u>n</u>	2.11	67.50	## \$10	0.00	72.50 s	0.19
77.50	N Si	Ø.38	82.50	12	0.57	87.50 :	0.38
92.50	88 89	0.19	97.50	H	0.38	102.50 :	0.00
107.50	25 28	0.00	112.50	24 68	0.00	117.50 :	0.00
122.50	22 22	0.00	127.50	85 86	0.00	132.50 :	0.00
137.50	85 89	0.00	142.50	n	0.00	147.50 :	0.00
d pres year pres pres year		JAN. 146, 146.	ييامتر حددي جمعه مدهدي في		ero ero ero		





No. of data points 553 Size class width 1.

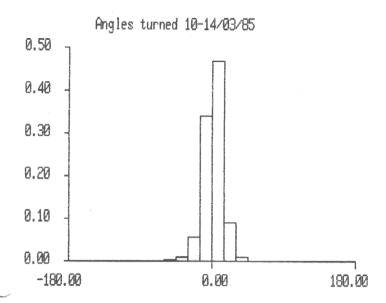
Size Class	Freq(%)	Size Class	Freq(%)	Size Class	Freq(%)
Ø.50 :	3.79	1.50	0.72		1.08
3.50 :		4.50 :	2.71	5.50 :	The state of
6.50 :	3,97	7.50:	5.60	8.50 :	The same of the same
9.50 :	5,24	10.50 :	7.23	11.50 :	6.87
12.50 :	9.40	13.50 :	6.14	14.50 :	5.96
15.50 :	5.06	16.50 :	4.88	17.50 :	3.61
18.50 :	5.06	19.50 :	4.52	20.50 :	3.43
21.50:	2.89	22.50 :	1.62	23.50 :	0.54
24.50 :	0.72	25.50 :	0.72	26.50 :	0.00
27.50 :	0.00	28.50 :	0.00	29.50 :	0.00

Normal statistics

Mean = 12.45 N = 553

Varience = 32.56

Std. Dev = 5.70



No. of data points 1348 Size class width 15.

Size Clas	5	Freq(%)	Size Clas	55	Freq(%)	Size Clas	5	Freq(%)
-172.50	n	0.00	-157.50	85 66	0.07	-142.50	##	0.14
-127.50	90 80	0.00	-112.50	98 98	0.07	-97.50	12 86	0.00
-82.50	II H	0.00	-67.50	35	0.07	-52.50	12 61	0.44
-37.50	12 25	1.19	-22.50	EE ZL	5.82	-7.50	81 88	34.30
7.50	41 61	47.01	22.50	25 88	9.34	37.50	n #	1.12
52.50	89 87	0.22	67.50	51 51	0.07	82.50	21	0.07
97.50	90 23	0.00	112.50	15 18	0.00	127.50	16 12	0.00
142.50	n n	0.00	157.50	12	0.00	172.50	T0	0.00

Normal statistics

Mean = 10.23 N = 1338

Varience = 129.68

Std. Dev = 11.38

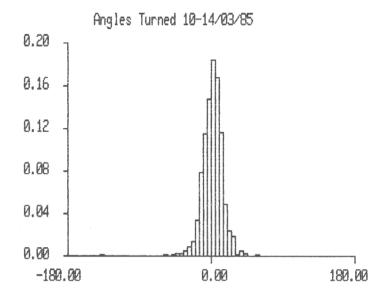
Proportion of +ve turns = 0.5769

Circular Statistics

Mean Angle = 1.50 N = 1338

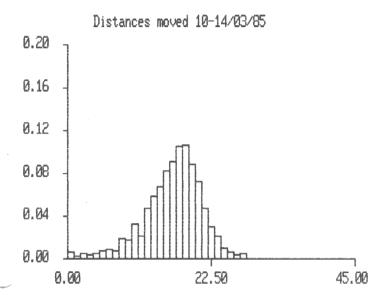
Directionality = 0.96

Angular Deviation = 14.39



No. of data points 1348 Size class width 5.

Size Class	Freq(%)	Size Clas	5	Freq(%)	Size Class	Freq(%)
-177.50	0.00	-172.50	80 15	0.00	-167.50 :	0.00
-162.50 :	0.07	-157.50	Et sa	0.00	-152.50 :	0.00
-147.50	0.00	-142,50	#	0.00	-137.50 :	0.14
-132.50	0.00	-127.50	16 16	0.00	-122.50 :	0.02
-117.50	0.03	-112.50	18 18	0.00	-107.50 :	0.07
-102.50 :	0.00	-97.50	# #	0.00	-92.50 :	0.00
-87.50	0.00	-82.50	#	0.00	-77.50 :	0.00
-72.50	0.00	-67.50	ts 17	0.07	-62.50 :	0.00
-57.50 :	0.14	-52,50	M E	0.07	-47.50 i	0.22
-42.50 :	0.29	-37.50	n	0.29	-32.50 :	0.59
-27.50	0.97	-22.50	EN RS	1.42	-17.50 :	3,43
-12.50	7.99	-7.50	#	11.50	-2.50 :	14.79
2.50 :	18.46	7.50	11 11	16.81	12.50 :	11.73
17.50	4.93	22.50	<u>n</u>	2.46	27.50 :	1.94
32.50 :	0.22	37.50	EE EB	Ø.52	42.50 :	0.37
47.50	0.00	52.50	15 15	0.07	57.50 :	0.14
62.50 :		67.5Ø	86. 68	0.00	72.50 :	0.00
77.50 :		82.50		0.07	87.50 :	0.00
92.50	0.00	97.50	EE 22	0.00	102.50 :	0.00
107.50 :	0.00	112.50	n n	0.00	117.50 :	0.00
122.50 :	0.00	127.50	8	0.00	132.50 :	0.00
137.50	0.00	142.50	π B	0.00	147.50 :	0.00
152.50	0.00	157.50	#	0.00	162.50 :	0.00
167.50	0.00	172.50	H H	0.00	177.50 :	0.00



No. of data points 1387 Size class width 1.

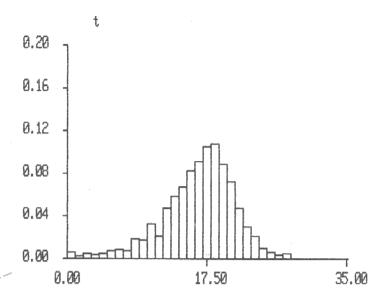
Size Class	Freq(%)	Size Class	Freq(%)	Size Class	Freq(%)
0.50 :	0.72	1.50 :	0.28	2.50 :	0.57
3.50 :	0.43	4.50 :	0.50	5.50 :	0.79
6.50 :	0.93	7.50 :	0.86	8.50 :	1.94
9.50 :	1.80	10.50 :	3 s 3 1	11.50 :	2.23
12.50 :	4.83	13.50 :	5.91	14.50 :	6.77
15.50 :	8.29	16.50 :	9.15	17.50 :	10.52
18.50 :	10.74	19.50 :	8.94	20.50 :	7.28
21.50 :	4.83	22.50 :	3.02	23.50 :	2.16
24.50 :	1.08	25.50 i	0.72	26.50 :	0.43
27.50 :	0.50	28.50 :	0.07	29.50 :	0.07
30.50 :	0.07	31.50 :	0.07	32.50 :	0.00
33.50 :	0.00	34.50 :	0.00	35.50 :	0.00
36.50 :	0.00	37.50 :	0.00	38.50 :	0.00
39.50 :	0.00	40.50 :	0.00	41.50	0.07
42.50 :	0.00	43.50 :	0.00	44.50 :	0.00

Normal statistics

Mean = 16.45 N = 1387

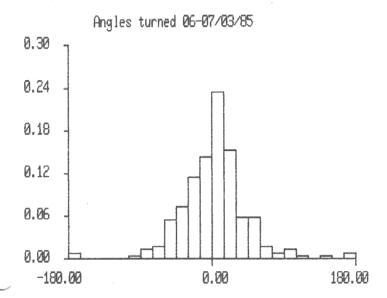
Varience = 22.41

Std. Dev = 4.73



No. of data points 1387 Size class width 1.

Size Class	Freq(%)	Size Class	Freq(%)	Size Class	Freq(%)
Ø.5Ø :	0.72	1.50	0.28	2.50 :	0.57
3.50 :	0.43	4.50 :	0.50		0.79
6.50 :	0.93	7.50 :	0.86	8.5Ø :	1.94
9.50 :	1.80	10.50:	3.31	11.50 :	2.23
12.50 :	4.83	13.50 :	5.91	14.50 :	6.78
15.50 :	8.29	16.50 :	9.16	17.50 :	10.53
18.50 :	10.75	19.50 :	8.94	20.50 :	7.28
21.50 :	4.83	22.50 :	3.03	23.50 :	2.16
24.50 :	1.08	25.50 :	Ø.72	26.50 :	0.43
27.50 :	0.50	28.50 :	0.07	29.50 :	0.07
30.50 :	0.07	31.50 :	0.07	32.50 :	0.00
33.50 :	0.00	34.50 :	0.00		



No. of data points 235 Size class width 15.

Size Clas	5	Freq(%)	Size Clas	55	Freq(%)	Size Clas	5	Freq(%)
-172.50	## #7	0.92	-157.50	64 53	0.00	-142.50	# #	0.00
-127.50	SE SE	0.00	-112.50	29 85	0.00	-97.50	16 28	0.46
-82.50	18 11	1.38	-67.50	11 11	1.84	-52.50	15	5.52
-37.50	85 86	7.37	-22.50	m m	11.52	-7.50	n n	14.28
7.50	99 H	23.50	22.50	**	15.20	37.50	HE M	5.99
52.50	35 88	5.99	67.50	er er	1.84	82.50	10 25	0.92
97.50	n n	1.38	112.50	2E	0.46	127.50)tc 85	0.00
142.50	88 90	0.46	157.50	88 60	0.00	172.50	n	0.92

Normal statistics

Mean = 30.45 N = 217

Varience = 977.24

Std. Dev = 31.26

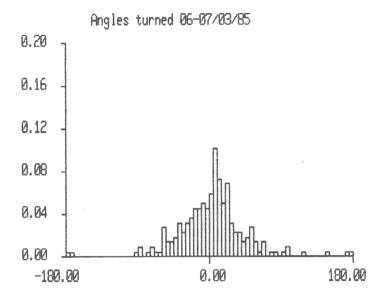
Proportion of +ve turns = 0.5668

Circular Statistics

Mean Angle = 2.28 N = 217

Directionality = 0.78

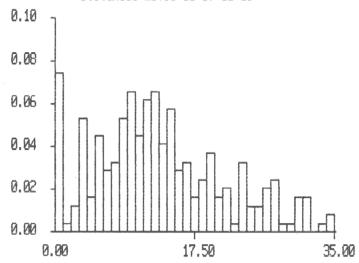
Angular Deviation = 39.53



No. of data points 235 Size class width 5.

Size Clas	55	Freq(%)	Size Clas	5	Freq(%)	Size Class	Freq(%)
-177.50	n n	0.46	-172.50	## ##	0.46	-167.50 :	0.00
-162.50	\$# \$#	0.00	-157.50	Ħ	0.00	-152.50 :	0.00
-147.50	ti H	0.00	-142.50	n n	0.00	-137.50 :	0.02
-132.50	**	0.03	-127.50	10	0.05	-122.50 :	0.06
-117.50	82 84	0.10	-112.50	## ##	0.07	-107.50	0.02
-102.50	tr tr	0.02	-97.50	12 53	0.00	-92.50 :	0.46
-87.50	88	0.92	-82.50	H	0.00	-77.50 :	0.46
-72.50	11	0.92	-67.50	25 61	0.46	-62.50 :	0.46
-57.50	n n	2.76	-52.50	82 20	1.38	-47.50	1.38
-42.50	er Er	1.84	-37,50	69 64	and the second	-32.50 :	2.30
-27.50	f9 11	3.22	-22.50	11 84	3.68	-17.50 :	4.60
-12.50	68 39	4.60	-7.50	M M	5.06	-2.50 :	4.60
2.50	II II	5.99	7.50	ER EA	10.13	12.50 :	7.37
17.50	ti si	5.06	22.5Ø	68 68	6.91	27.50 :	3.22
32.50	n n	2.30	37.50	81. 21.	2.30	42.50 :	1.38
47.50	**	1.84	52.50	m m	2.76	57.50 :	1.38
62.50	m u	0.46	67.50	E E	1.38	72.50 i	0.00
77.50	8	0.46	82.50	EE SA	0.46	87.50 :	0.00
92.50	65 68	0.46	97.50	89 10	0,92	102.50 :	0.00
107.50	19	0.00	112.50	H	0.00	117.50 :	0.46
122.50	88 86	0.00	127.50	10 15	0.00	132.50 :	0.00
137.50	21	0.00	142.50	es se	0.00	147, 50 :	0.46
152.50	55 49	0.00	157.50	**	0.00	162.50 :	0.00
167.50	35 85	0.00	172.50	20	0.46	177.50 :	0.46





No. of data points 242 Size class width 1.

Size Class	Freq(%)	Size Class	Freq(%)	Size Class	Freq(%)
0.50:	7.43	1.50 :	Ø. 41	2.50 :	1.23
3.50:	5.37	4.50	1.65	5.50 :	4.54
6.50 :	2.89	7.50 :	3.30	8.50 :	5.37
9.50 :	6.61	10.50 :	4.54	11.50 :	6.19
12.50 :	6.61	13.50 :	4.13	14.50 :	5.78
15.50 :	2.89	16.50 :	3.30	17.50 :	1.65
18.50 :	2.47	19.50 :	3.71	20.50 :	1.65
21.50 :	2.06	22.50 :	0.41	23.50 :	3.30
24.50 :	1.23	25.50 :	1.23	26.50 :	2.06
27.50 :	2.47	28,50 :	0.41	29.50 i	0.41
30.50 :	1.65	31,50 :	1.65	32.50 :	0.00
33.50 :	0.41	34.50 :	0.82		

Normal statistics

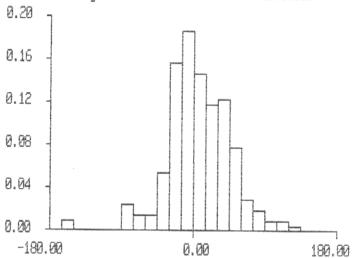
Mean = 13.15 N = 242

Varience = 68.36

Std. Dev = 8.26

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132
133
137
144
146
148

Angles turned 01-05/05/85 (P.Sordidus)



No. of data points 211 Size class width 15.

Size Clas	5 (11)	Freq(%)	Size Clas	===	Freq(%)	Size Class	Freq(%)
-172.50	10 20	0.00	-157.50	N N	0.98	-142.50 :	0.00
-127.50	w	0.00	-112.50	ar is	0.00	-97.50 :	0.00
-82.50	2E 2F	2.45	-67.50	25. 36	1.47		1.47
-37.50	EE da	5.39	-22.50	st tt	15.68	-7.50 s	18.62
7.50	95 75	14.70	22.50	TI N	11.76	37.50 :	12.25
52.50	ut es	7.84	67.50	55 28	2.94	82.50 :	1.96
97.50	22	0.98	112.50	52 83	0.98	127.50 :	0.49
142.50	is is	0.00	157.50	asi to	0.00	172.50 :	0.00

Normal statistics

Mean = 31.08 N = 204

Varience = 734.84

Std. Dev = 27.10

Proportion of tve turns = 0.5392

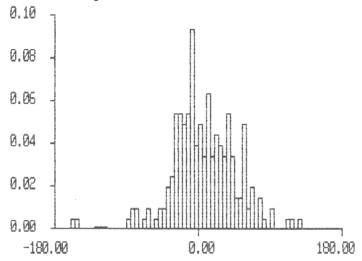
Circular Statistics

Mean Angle = 7.51 N = 204

Directionality = 0.79

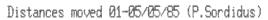
Angular Deviation = 39.05

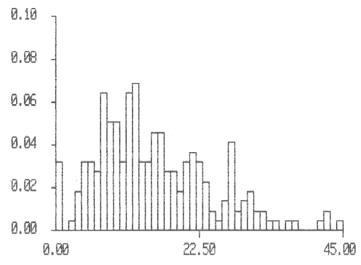
Angles turned 01-05/05/85 (P.Sordidus)



No. of data points 211 Size class width 5.

Size Clas	5	Freq(%)	Size Clas	55	Freq(%)	Size Class	25	Freq(%)
-177.50	III	0.00	-172.50	111 69	0.00	-167.50	**	0.00
-162.50	25 26	0.00	-157.50	20	0.49	-152.50	SE SE	0.49
-147.50	58 85	0.01	-142.50	35 23	0.00	-137.50	84. 88	0.00
-132.50	III al	0.02	-127.50	n	0.07	-122.50	eā se	0.09
-117.50	er ss	0.07	-112.50	25 69	0.05	-107.50	ts H	0.06
-102.50	**	0.03	-97.5Ø	99	0.01	-92.50	n B	0.00
-87.50	33 33	0.49	-82.50	tu m	0.98	-77.50	54. 84	0.98
-72.50	15 26	0.00	-67.50	20 52	0.49	-62.50	85 82	0.98
-57.50	B B	0.00	-52.50	12 63	0.49	-47.50	48 80	0.98
-42.50	er n	0.98	-37.50	10 02	1.96	-32.50	16 10	2.45
-27.50	68 80	5.39	-22.50	85 85	m = 749	-17.50	11	4.90
-12.50	13 25	5.39	-7.50	10 10	9.31	-2.50	at ea	3.92
2.50	18 88	4.90	7.50	21	3.43	12.50	er El	6.37
17.50	is N	3.43	22.50	3.8 95	4,41	27.50	n	3.92
32.50	86 87	3.43	37,50	in St	5.39	42.50	11 12	3.43
47.50	11	1.47	52.50	FF FF	1.47	57.50	an mi	4.90
62.50	12	0.98	67.50	171 88	1.96	72.50	RE DR	0.00
77.50	81 51	1.47	82.50	35 16	0.49	87.50	14 11	0.00
92.50	14. 20	0.98	97.50	15 15	0.00	102.50	26	0.00
107.50	EE EV	0.00	112.50	N	0.49	117.50	62 63	0.49
122.50	n n	0.00	127.50	EE EE	0.49	132.50	88 88	0.00
137.50	計	0.00	142.50	53: 85	0.00	147.50	91 10	0.00
152.50	is ts	0.00	157.50	ės Di	0.00	162.50	58 85	0.00
167.50	18 86	0.00	172.50	53 55	0.00	177.50	58 55	0.00





No. of data points 217 Size class width 1.

Size Clas	5.05	Freq(%)	Size Clas	55	Freq(%)	Size Class	Freq(%)
0.50	ut n	3.22	1.50	86	0.00	2.50 :	0.46
3.50	22 23	1.84	4.50	n n	any my mag	5.50 :	3.22
6.50	52 26	2.76	7.50	es is	6.45	8.50 :	5.06
9.50	10 10	5.06	10.50	38 88	3.22	11.50 :	6.45
12.50	18 18	6.91	13.50	75 11	rest of the second	14.50 :	3.22
15.50	EL CA	4.60	16.50	M Si	4.60	17.50 :	2.76
18.50	m se	2.76	19.50	83 88	1.84	20.50 :	5.22
21.50	28 28	3.68	22.50	od 68		23.50 :	2.30
24.50	22 06	0.92	25.50	is ds	0.46	26.50 :	1,38
27.50	29 20	4.14	28.50	11	0.92	29.50 :	1.38
30.50	75 26	1.84	31.50	27. 88.	0.92	32.50 :	0.92
33.50	7E	0.46	34.50	95	0.46	35.50 a	0.00
36.50	12	0.46	37.50	T2 EE	0.46	38.50 :	0.00
39.50	83 52	0.00	40.50	n n	0.00	41.50 :	0.46
42.50	11	0.92	43.50	n	0.00	44.50 :	0.46

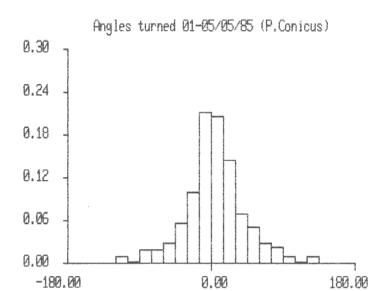
Normal statistics

Mean = 15.49 N = 217

Varience = 80.53

Std. Dev = 8.97

Trek No.s 135 139 142 150 152 154 156 158



No. of data points 312 Size class width 15.

Freq(%)	Size Class	Freq(%)	Size Class	Freq(%)
0.00	-157.50 :	0.00	-142.50	0.00
0.00	-112.50 :	0.96	-97.50	0.32
1.93	-67.50 i	1.93	-52.50 :	2.90
5.80	-22.50 s	10.00	-7.50 :	21.29
20.64	22.50 :	14.51	37.50 :	7.09
5.16	67.50 s	2.90	82.50 :	2.25
0.96	112.50 :	0.32	127.50 :	0.96
0.00	157.50 s	0.00	172.50 :	0.00
	Ø. ØØ 1.93 5.8Ø 2Ø.64 5.16 Ø.96	0.00 -157.50 0.00 -112.50 1.93 -67.50 5.80 -22.50 20.64 22.50 5.16 67.50 0.96 112.50	Ø. ØØ -157.5Ø: Ø. ØØ Ø. ØØ -112.5Ø: Ø. 96 1. 93 -67.5Ø: 1. 93 5. 8Ø -22.5Ø: 1Ø. ØØ 2Ø. 64 22. 5Ø: 14. 51 5. 16 67. 5Ø: 2. 9Ø Ø. 96 112. 5Ø: Ø. 32	Ø. ØØ -157.5Ø : Ø. ØØ -142.5Ø : Ø. ØØ -112.5Ø : Ø. 96 -97.5Ø : 1. 93 -67.5Ø : 1. 93 -52.5Ø : 5. 8Ø -22.5Ø : 1Ø. ØØ -7.5Ø : 2Ø. 64 22. 5Ø : 14. 51 37. 5Ø : 5. 16 67. 5Ø : 2. 9Ø 82. 5Ø : Ø. 96 112. 5Ø : Ø. 32 127. 5Ø :

Normal statistics

Mean = 27.85 N = 310

Varience = 727.68

Std. Dev = 26.97

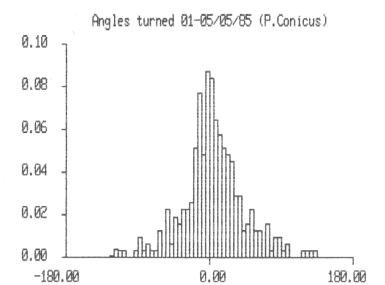
Proportion of +ve turns = 0.5483

Circular Statistics

Mean Angle = 4.50 N = 310

Directionality = 0.80

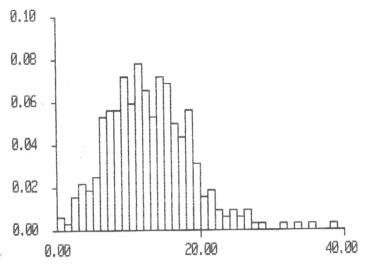
Angular Deviation = 37.37



No. of data points 312 Size class width 5.

Size Clas	5 55	Freq(%)	Size Clas	55	Freq(%)		Size Clas	S (3)	Freq(%)
-177.50	98 98	0.00	-172.50	10 10	0.00		-167.50	11	0.00
-162.50	95 55	0.00	-157.50	ii ii	0.00		-152.50	52 81	0.00
-147.50	23. 28	0.00	-142.50	#	0.00		-137.50	40 13	0.00
-132.50	54 67	0.01	-127.50	#	0.03		-122.50	n o	0.06
-117.50	18 16	0.38	-112.50	11 11	0.36	1	-107.50	31 88	0.34
-102.50	15 15	Ø.Ø1	-97.50	II E	0.00		-92.50	53 84	0.32
-87.50	23 88	0.97	-82.50	#	0.32		-77.50	81 82	0.64
-72.50	##	0.32	-67.50	87 39	0.32		-62.50	12 22	1.29
-57.50	et vi	0.00	-52.50	u u	2.25		-47.50	tis 28	0.64
-42.50	25 28	1.93	-37.50	ii ii	1.61		-32.50	ES M	2.25
-27.50	38 58	dia a dia wil	-22.50	II II	2.58		-17.50	ES 20	5.16
-12.50	n n	7.74	-7.50	11 21	4.83		-2.50	88 86	8.70
2.50	8E 68	8.38	7.50	20 27	6.45		12.50	we es	5.80
17.50	88 29	5.16	22.50	DE DE	4.83		27.50	#	4.51
32.50	12 E8	2.90	37.50	a n	2.90		42.50	**	1.29
47.50	in m	1.61	52.50	11 0	2.25		57.50	13 (1)	1.29
62.50	80 80	1.29	67.50	21 81	0.00		72.50	80 10	1.61
77.50	88 68	0.32	82.50	13 11	0.96		87.50	76 25	0.96
92.50	70 11	0.32	97.50	55 67	0.64		102.50	13 82	0.00
107.50	89 88	0.00	112.50	es M	0.00		117.50	65 68	0.32
122.50	88 20	0.32	127.50	15 21	0.32		132.50	11 01	0.32
137.50	84 95	0.00	142.50	SE éà	0.00		147.50	29	0.00
152,50	2	0.00	157.50	st st	0.00		162.50	EE.	0.00
167.50	20 26	0.00	172.50	85 89	0.00		177.50	55 50	0.00

Distances moved 01-05/05/85 (P.Conicus)



No. of data points 320 Size class width 1.

Size Class	Freq(%)	Size Clas	5 55	Freq(%)	Size Class	Freq(%)
0.50:	Ø.62	1.50	80 9F	0.31	2.50 :	1.56
3.50:	2.18	4.50	25 21	1.87	5.50 :	2.50
6.50 :	5.31	7.50	10 81	5.62	8.50	5.62
9.50 :	7.18	10.50	85 88	5.93	11.50 :	7.81
12.50 :	6.56	13.50	85 82	5.31	14.50 :	7.18
15.50 :	6.87	16.50	un ar	5.00	17.50 :	4.37
18.50 :	5.62	19.50	E E	3.12	20.50 i	1.56
21.50 :	1.87	22.50	ss ss	0.93	23.50 :	0.62
24.50 :	0.93	25.50	n n	0.62	26.50 :	0.93
27.50 :	0.31	28.50	14 19	0.31	29.50 :	0.00
30.50 :	0.00	31.50	11 22	0.31	32.50 :	0.00
	0.31	34.50	n n	0.00	35.50	0.31
36.50 :	0.00	37.50	18 60	0.00	38.50 :	0.31
39.50 :	0.00					

Normal statistics

Mean = 13.00 N = 320

Varience = 35.25

Std. Dev = 5.93