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SURVEY OF SOIL FAUNA

1971 - 1972

J.A. Springett

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DEPARTMENT OF CONSERVATION
& LAND MANAGEMENT
WESTERN AUSTRALIA

Survey of Soil Fauna - 1971-1972

Introduction

The aim of this survey was to collect and compare soil animals from a number of well documented forest sites of interest to other members of the research branch. Fifteen sites in the northern Jarrah-Wandoo series, two sites near Dwellingup in prime Jarrah and thirteen sites in the Karri forests were sampled in a standard manner. Less intensive collections have been made from a further twenty sites but, while the species collected are recorded in the main data sheets and have been used for comparative taxonomic studies, these sites have not been included in the association analysis.

Collection sites

See Appendix I

Method

The thirty well documented sites were sampled during October and November 1971, the period at which maximum soil activity and animal populations are to be expected. Collectic methods were standardised, four $^{1}/10m^{2}$ soil samples were cut in the field and hand sorted in the laboratory, ten $^{1}/100m^{2}$ soil samples were heat extracted in the laboratory, in addition animals were collected by hand sorting the litter and searching under logs at each site. All animals were sorted into their major taxonomic groupings and stored

in alcohol for more detailed taxonomic study. Provisional identifications to genus or species level were made where possible and material then sent to specialists for verification and further study.

Results

Records of animals identified.

A total of 123 different animal groups within the mesofauna were recognised initially, some of these have since been separated by specialist taxonomists and when the reports from all the specialists are received the total number of species will undoubtedly be many more than 123.

Scorpionoidae Four species were found Isometroides vescus, Lychas marmoreus, Urodacus novohollandia Peters and Cercophoneus sp. all identifications have been verified by Mr L. Koch of the West Australian Museum.

Diplopoda

Cambalidae The species of this group were not separated by me but Mr P.M. Johns of Christchurch N.Z. has recognised five species; Atelomastix nigrescens Attems Atelomastix n.sp. A, Atelomastix n.sp. B, Podykipus collinus Attems and P. leptoiloides Attems.

Paradoxosomatidae

I distinguished two species in this group and they have been identified by Mr Johns as Akamptogonus novarae

(Humbert and Saussure) and Antichiropus sp.

Dalodesmidae

I distinguished two species in this group, both have been identified as Sphaerotrichopus spp. one of them being a new species.

Polyzonidae

The two species of this group are Siphonotus sp and Rhinotus sp.

Chilopoda

No reply has as yet been received from Dr Crabill of the Smithsonian Institution and identifications are preliminary, using Main's (1968) guide.

Scolopendridae

Four genera were distinguished, Cormocephalus sp, Cryptos sp, Otostigmus sp and Scolopendra sp.

Geophilidae

This group was separated into three types on morphological characters but no identifications were attempted.

Lithobiidae

The two members of this group were provisionally identified as Lamyctes sp and Dichelobius sp

Oniscoidea

Oniscidae : Philoscinae

Seven separate forms of the species complex Philoscia s. lat. have been distinguished some of which belong to the subgenus Laevophiloscia. The animals are fairly readily distinguished from each other but the taxonomy of the Philoscia complex is such that no specific determinations are possible without a great deal of work, particularly with male specimens which occur only rarely in the field. (Vandel pers. comm.). Taxonomic works consulted include: Barnard 1932, 1936, 1937, Barnes 1934, Bowley 1935, Budde-Lund 1906, 1912, , Chilton 1901, 1915, Edney 1953, Hale 1929, Jackson 1941, Nicholls and Barnes 1927, Vandel 1952, Wahrberg 1922

Porcellionidae

Two porcellionids have been distinguished, one Porcellio laevis Linne is an introduced cosmopolitan species.

Styloniscidae

Two styloniscid species were collected but have not been identified, they probably belong to the genus Styloniscus

Armadillidae

Nine members of this family have been collected. One species (Armadelliduim vulgare Latreille) is

cosmopolitan, seven species belong to the subgenus Buddelundia. None of these seven species are completely described by any of the diagnoses of the 23 species of this genus which have been described from the state. Where possible specimens were checked against type specimens in the W.A. Museum. The ninth specimen is the same in all respects as those lodged in the W.A. Museum as - Cubaris wilsmorei Nicholls and Barnes, these specimens are however excluded from the genus Cubaris ss by having spines on the body. Barnard 1932, p318 suggested that C. wilsmorei should probably be transferred to Akermania but Green (1961) advocates leaving the names species of Cubaris which do not belong in Cubaris s.s in Cubaris s.lat. until they can all be re-examined. This same species appears to be lodged in the W.A. Museum both as Cubaris wilsmorei, in some cases misspelt C. wilsomeri, and as Ackermania sp - a presumed misspelling of Akermania.

Amphipoda

As there were no males amongst the collected specimens identification was not possible. Two genera Parorchestia and Talitriator have previously been recorded for Pemberton (Main 1968).

Oligochaeta

Only two groups of oligochaete worms were distinguished those in which the adults were less than 5cm long and those in which the adults were more than 5cm long.

Araneae

[illegible] separate groupings were used for the [illegible] specimens but most of these contain several genera, only five of the groupings [illegible] to the [illegible]on are Lycosa spp, [illegible] spp, Stanwellia spp and Missulena spp. B.Y. Main has confirmed the identification of the Dipluridae, the Chenistonia spp are undescribed but one at least is closely related to C. maculata, and one of the Stanwellias is S. occidentalis Main, the other being undescribed.

Formicidae

Twenty two groups of ants were classed at subfamily level. 6 differing groups of Formicnae, 7 of Ponerinae, 4 of Myrmicnae, 4 of Dolichoderminae and one Myrmeciina Final identification is likely to produce far more than twenty two species.

Mollusca

The slugs and snails have been provisionally identified by Mr G. Kendrick of the W.A. Museum. The slugs are all limacid slugs and are all introduced. Of the snails

collected one genus Oxychilus Fitzinger is introduced and is widespread and common particularly in the Manjimup-Pemberton area. Six other, native genera were identified by Mr Kendrick, Bothriembryon Pilsbry, Luinodiscus Iredale, Pernagera Iredale, Austrosuccinea Iredale, Annoselix dolosa Iredale, and Westralaoma Iredale.

INSECTS

Blattoidea

Thirteen groups of cookroaches were distinguished only one of which was provisionally identified as Laxta sp. Other insects included Curculionidae (Anycterinae) Dermapteri, Scarabaeidae, Hemiptera and coleopterous larvae.

Onychophora

Two species Peripatoides occidentalis and P. gilesii were collected.

Platyhelminthidae, Turbellaria, Terricola Geoplana spp

Three colour forms were distinguished, the first with a brown or brownish purple dorsum, the second with a pale buff dorsum with 6-8 dark longtudinal stripes and the third with a bright lemon dorsum.

Phalangidae

Both Laniatores and Palpatores occur, the former being more common, no definite identification of specimens

Land Planarians and the limpet-shaped cockroach Laxta. Animals which occur within this group of sites but are further limited to the Karri country are Cubaris wilsmorei, Styloniscus spp., Siphonotus sp., Rhinotus sp., Austrosuccinea sp., Luinodiscus sp, Anoselix sp.. These sites tend to have a less diverse ant fauna than was observed in the poorer or drier forest sites and they are also typically lacking in the genera Antichiropus, Miturga, Otostigmus, and Scolopendra. These four genera are typical of the Wandoo savannah country although a species of Antichiropus was also found in the north easternmost of the Karri sites in the Shannon block and Miturga in the Karri forest in the Porongurups.

The Wandoo type woodlands are usually without the Cambalidae (Atelomastix spp and Podykipus spp) Land planarians and Amphipoda. Within this group of sites, 5,14 and 10 have over 50% of their animal groups in common as do sites 8 and 11. A diagramatic map of the similarity of the sites is given in figure 1 showing 60% similarity, 50% similarity and 40% similarity. The sites have been tabulated (Table 3) also according to their quotient of similarity and from Table 3 it can be seen that two sites, site 15 a leached grey sand near Mundaring and a peaty sand near Manjimup have least similarity to any site or to each other. These poor sites tend to have a few of the wider ranging species rather than any specialised animal which occurs only on that site.

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Fig. 1. Diagrammatic representation of the similarity of sample sites.

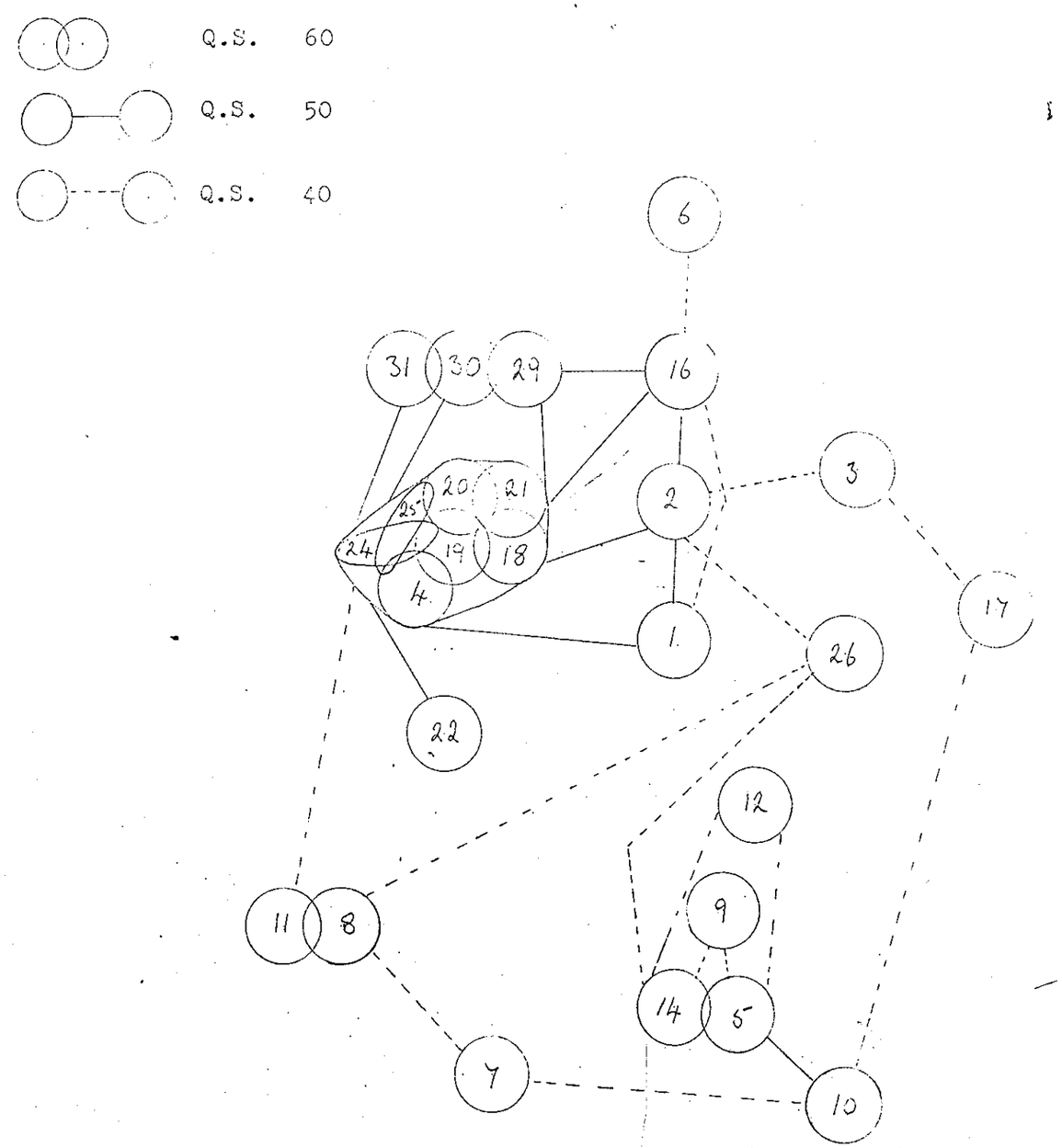


Table 2 Trellis diagram with sites arranged to bring similar sites together.

Sites with quotient of similarity more than 50% are hatched.

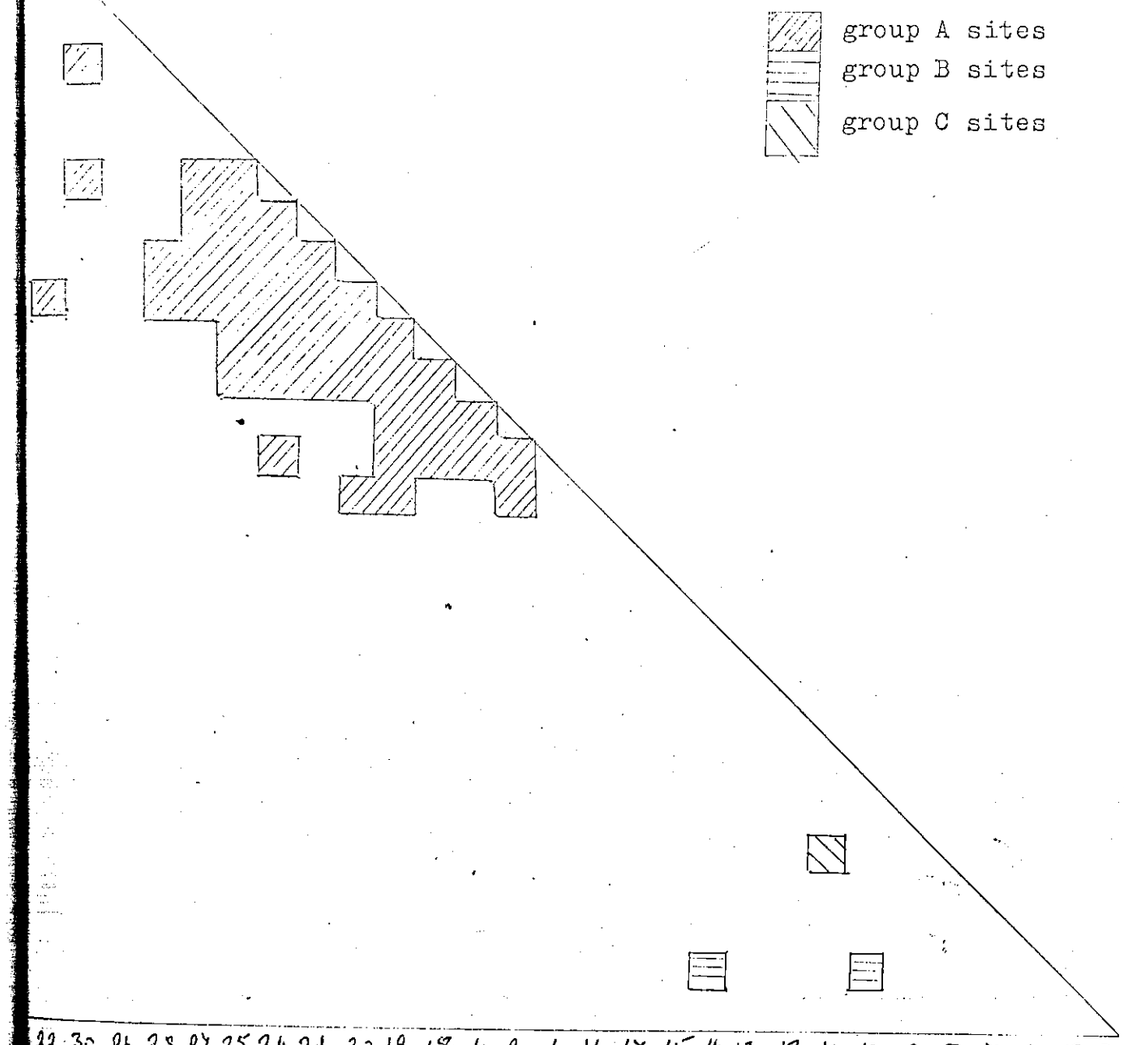


Table 2a Initial trellis diagram with Sorenson's quotients of similarity.

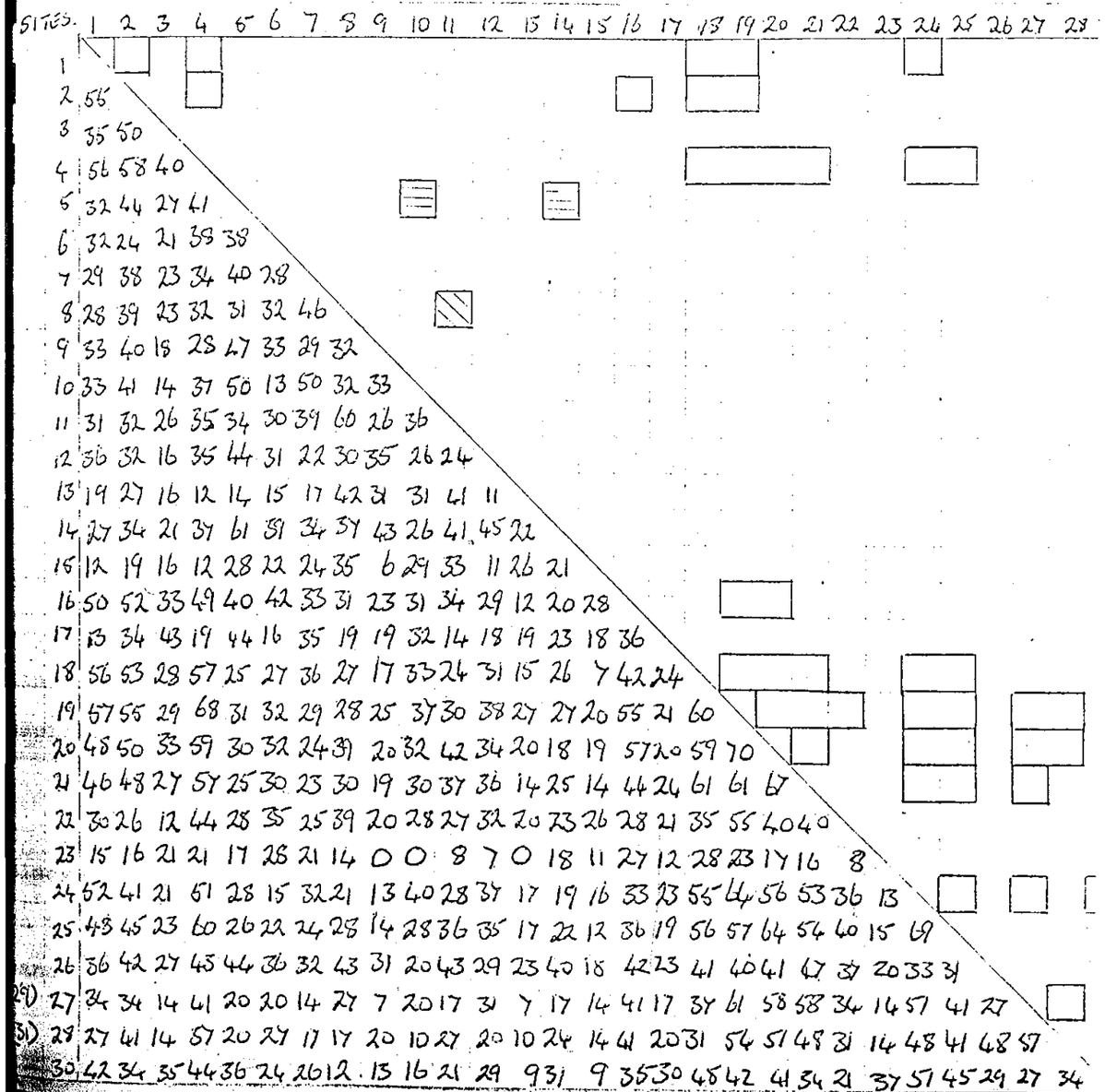


Table 3 Sample sites grouped according to their quotient of similarity.

	>70	>60	>50	>40	>30	
Virgin Karri	19,20	4,21,24				
Marri/Karri		25,18	1,2	3,5,10		
				20,6,11	15,23	
			16,22			
				17,9,7,8		
Marri/Karri				13,14,12		
Alluvium	30,31	29				
Marri/Karri						
podzol						
Marri/Jarrah			26,7	1,3,8,13		
grey sand	5,14	10	2,4,9	14,16,18		
			17,11,12	19,20,21	15,23	
Yandoo				22,24,25		
Alluvium				29,30,31,6		
Yandoo						
basic loam	8,11		13,26	9,2,1,3		Mundaring leached sand
Blackbutt				4,5,6,7	15,23	
on yellow				10,12		
sand				16,17,18,19 21,22,24 25,28,29,30		Manjimup peaty sand

Table 3 continued Animals characteristic of each site group.

Site group	Animals typically present	Animals typically absent
A	Amphipoda	Scolopendra sp.
	Laureola wilsmorei	Allotheura maculata
	Geoplana spp.	Urodacus novohollandea
	Onycophora	Buddelundia spp.
	Styloniscus australiensis	Miturga sp.
	Laxta sp.	Otostigmus
	Cerophoneus	Antichiropus sp.
	Cambalidae	
B and C	Otostigmus sp.	Cambalidae
	Scolopendra sp.	Amphipoda
	Miturga sp.	Styloniscus australiensis
	Antichiropus sp.	Geoplana spp.
	Buddelundia	
	Urodacus	

The lack of pattern in this case may be caused by insuffic ient taxonomic detail. For example the Geophilidae which occurred on almost all sites were only divided into three groups, identification to species level will probably make it possible to delimit patterns of distribution.

Comparison with Museum material

It was felt that study of the collected species in th West Australian Museum might clarify some of the taxonomic distribution problems. However close study of the Oniscoi showed that the majority of collections had been made duri the University long vacations i.e. during January and Febr The species distribution was very different from that reco by me in October and November, except that Laevophiloscia were generally distributed, and Cubaris wilsmorei was restr to Karri forest. To check whether the reason for the diff was the different season of collection or whether some fun mental change had occurred throughout the forests during t intervening 30-70 years since the Museum collections were a single set of hand collections were made in summer in th Karri/Marri forests near Pemberton, sites 29,28,24,25 and sites 12, 13 and 14 in the drier north east of the working In all these sites the abundance of animals was much less in the spring and on the dry sites (12,13,14) consisted of the same species as the spring survey. However the sample in the Karri country contained a different spectrum of

species, mainly the two species Cubaris wilsmorei and Buddelundia spp and not the three species C. wilsmorei, Laevophiloscia sp and Styloniscus spp which were found during the spring. (Styloniscus spp do not seem to have been previously collected from W.A. The species of this genus present in the W.A. Museum are paratypes of Tasmanian species lodged by Alison Green 1961). The summer distribution of genera was therefore similar to that of museum records althou neither collection is d etailed enough to show loss of rare species. Buddelundia is a genus well adapted to dry conditio two new species of this genus have been collected from Millstream and from the Murchison River. There are over 20 species occurring in the south west of the state with probabl many more in the north. The present survey seems to indicate that the genus has a pattern of winter and spring distributio in the drier habitats and a summer distribution in the wetter habitats where in the winter it is replaced by less well drought adapted species of the Philoscinae and Styloniscidae.

Effect of burning

There are two pairs of sites in the survey which are similar in all respects except their burning history, sites 16 and 17 and sites 24 and 25. One other pair of sites in which the forest in one site has been cleared, burned and allowed to regenerate while the other site is untouched, is sites 18 and 19. In all these pairs of sites there is a reduction in the numbers of species found in the burnt sites (Table 3).

TABLE 3

NUMBER OF ANIMAL GROUPS ON BURNT AND UNBURNT SITES

Sites	Burnt	Unburnt	Reduction in Animal Groups
16-17	11	26	15
18-19	16	28	12
24-25	20	28	8

The reduction in the amount of cover in the litter layer and the concentration of the animals under logs makes it easier to find animals in the burnt site so that at first sight the fauna does not seem to be impoverished. However examination of the species structure clearly shows that the diversity has been much reduced.

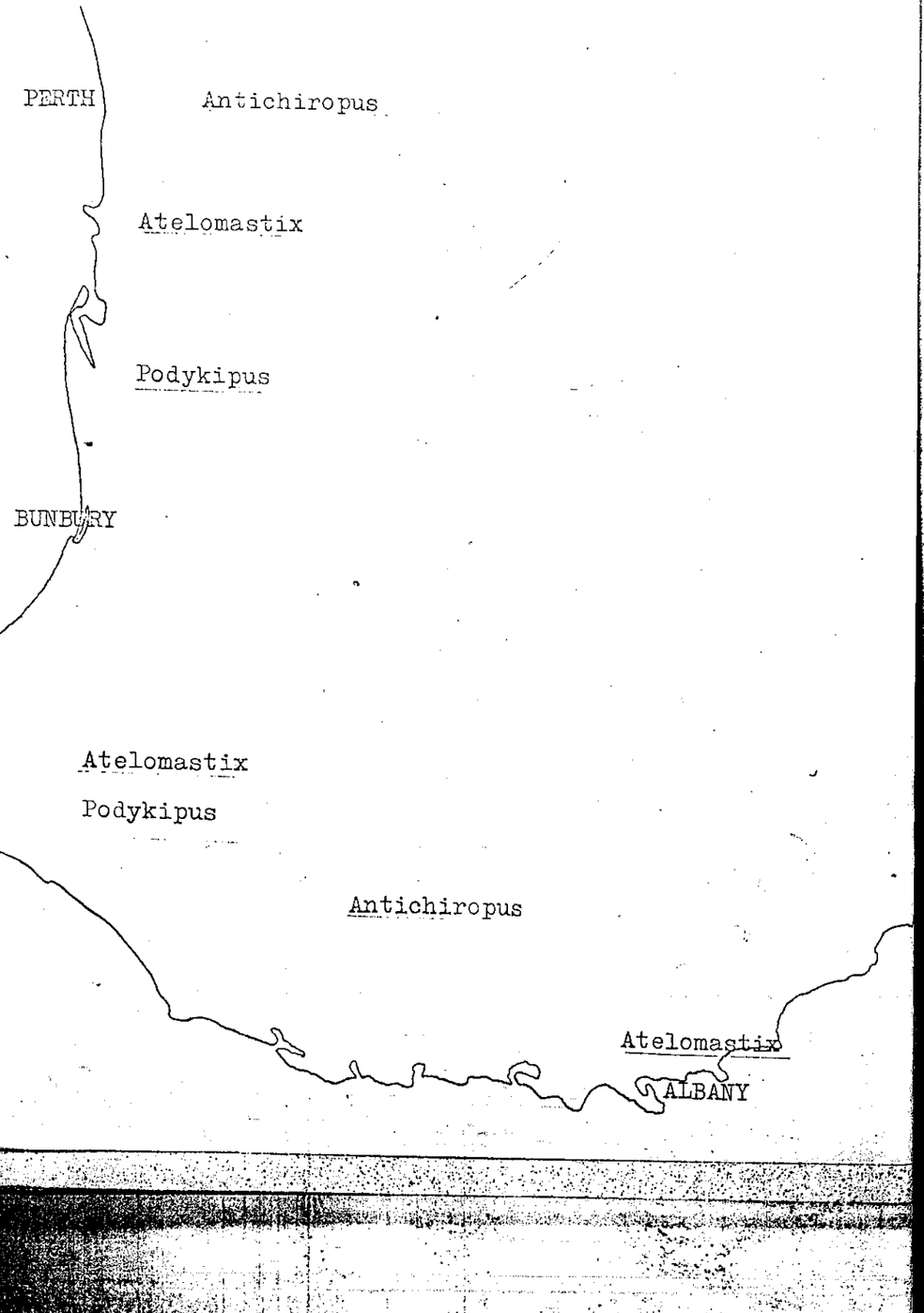
One other site which had undergone a recent severe bur was site 26 and this had a relatively high number of specie 24 recorded species, however the site had elements of both the rich forest fauna and the savannah type fauna and in its natural form may have been even richer.

Discussion

The abundance of new species which have been collected during the year, the impoverished state of the taxonomy of soil animals in general and the paucity of previously recor data on species distributions (see Springett 1971) make it impossible to derive detailed maps of species distribution

in response to site factors such as soil type, climate and vegetation. For example it appears that the two described species of Podykipus, P. collinus and P.leptoiuloides are associated with Jarrah or Karri forest with differing understories, P. collinus being found in Karri or Jarrah with a broad leaved scrub layer and P. leptoiuloides in Karri forest with dense Casurina understorey forming a largely needle like litter layer. The three species of Atelomastix occur in the northern Jarrah, the Porongorups and in Bullich scrub on Mt Gardiner, only one of these species A.nigrescens is described. The eastern savannah type distribution of Antichiropus suggests that these three genera may be geographically distributed according to the following pattern (Figure 2 however detailed distribution maps of particular genera or species are outside the scope of this survey. It might have been expected that the Jarrah forest would be poorer in species as it is often stated the Jarrah has a less diverse fauna than Karri forest or Wandoo woodlands. However where the Jarrah has not been burnt there were as many species found in the rich Karri forest. The level of taxonomic discrimination is not fine enough to show what differences there are between the Karri forest, rich Jarrah and Bullich swamp. The faunas of these sites are similar at this level of analysis. It is not possible to tell whether all three types are different at the species level or whether any two of them show marked similarity.

Possible distribution of three Diplopod genera.



The changes in typical distribution patterns of Buddelundia species with season are possibly of more immediate interest. It implies that the soil fauna has the ability to change in character with the season rather than to simply become less active, and if this is so then the timing of controlled burning may be even more critical than has been supposed. One aspect of the effect of burning on the soil and litter is to alter the microclimate, it would appear that relatively small changes in the microclimate can alter the competitive ability of some species so as to create a change in the faunal species composition. This may not be important in itself in the management of forested areas for timber production even though simplified ecosystems may tend to be susceptible to outbreaks of pests and diseases, but it could be a major factor in determining the distribution and survival of some of the small insectivorous marsupials of the forest.

Table 5 Numbers of animals per square metre. Results of hand sorting turves. Sample size 4 x $^{1}/_{10m^2}$. (Sites 1,2,3, 10 x $^{1}/_{100m^2}$)

SITE	worms	land planarians	centipedes	spiders	woodlice	insect larvae	mature insects	snails & slugs	millipedes	amphipods	phalangids	Total
1	40	3	21	12	15	(70)		–	–	9	–	170
2	90	–	20	10	10	(90)		–	30	10	–	260
3	–	–	30	–	–	(70)		–	–	–	–	100
4	85	–	23	10	10	10	3	5	–	3	3	152
5	30	–	5	3	5	13	3	–	–	–	–	59
6	45	15	–	3	–	15	3	–	–	–	–	81
7	10	–	–	3	–	8	3	–	–	–	–	24
8	–	–	5	3	3	18	–	–	15	–	–	44
9	–	–	–	3	–	13	10	–	–	–	–	26
10	10	–	–	–	–	13	13	–	–	–	–	36
11	10	–	5	–	–	13	13	–	–	–	–	41
12	–	–	8	5	–	(15)		3	5	–	5	41
13	–	–	5	3	3	(13)		–	–	–	–	24
14	–	–	8	3	–	(10)		–	–	–	–	21
15	–	–	5	–	3	(8)		–	–	–	–	16
16	30	10	40	40	40	190	50	10	–	–	–	410
17	40	–	10	20	–	10	10	–	–	–	–	90
18	10	–	8	5	8	20	18	8	10	–	–	87
19	20	5	13	10	–	(50)		3	20	–	–	121
20	28	–	30	30	23	(48)		–	18	13	–	189
21	13	–	18	25	13	18	20	–	18	20	3	148
22	–	–	–	3	5	(5)		–	5	–	–	18
23	100	–	13	–	–	(400)		5	–	–	–	518
24	90	10	90	25	80	25	15	–	145	20	15	515
25	3	–	15	8	10	5	5	5	13	3	–	67
26	–	–	3	5	–	10	13	–	10	–	–	41
27	30	–	33	30	180	(60)		20	38	103	13	507
28	28	–	18	10	23	(15)		10	8	25	–	137
29	15	3	23	20	63	(28)		15	28	73	8	276

Summary

Thirty forest sites were surveyed for soil animals in a standard manner. Less intensive coll tions were made from twenty additional sites.

Over 123 different animal groups were recognise in the preliminary sorting of specimens. Speciali taxonomists have been consulted for many of the groups and to date (September 1972 two new millipe species and one new millipede genus have been sepa ted but not yet named or described and two new species of wood lice Styloniscus australiensis Va and Australoniscus springetti Vandel have been nam

The occurrence of each animal group on each si is shown in table form Table 1. A similarity analysis of sites was carried out using Sorensen' quotient of similarity. The results are expresse diagrammatically in tables 2 and 3 and fig. 1. this level of analysis the rich wet forest sites have similar faunas characterised by, amphipods l planarians, the millipede genera Atelomastix and Podykipus and the Philoscine and Styloniscine isopods. The wandoo woodlands are characterised the millipede Antichiropus sp; the centipede Scolopendra sp. and Buddelundia spp. Where simil sites with different fire histories were sampled

was found that the mesofaunal diversity was reduce on the burnt sites. The number of animals per square metre was also less on the burnt sites (table 5). A catalogue of specimens collected with the name of the consulting taxonomist and the location of the specimens is appended. A list of sample sites with map reference and brief description of the site is appended.

Results of chemical and physical analysis of the sampled soil are appended.

Correspondence with the consulting taxonomists is appended.

CATALOGUE OF SPECIMENS COLLECTED DURING SOIL FAUNA SURVEY 1971-72

Identification		Lodged with	Duplicate specimens sent to Specialist taxonomist
Site and Tube No.	Taxonomic Group		
	Scorpionidae Fam Bothriuridae	W.A. Museum	Mr L. Koch
21	Cercophonius sp	"	W.A. Museum
27	"	"	"
33	"	"	"
46	"	"	"
2	Urodacus novaehollandiae Peters		
4	"	"	
5	"	"	
7	"	"	
8	"	"	
9	"	"	
10	"	"	
11	"	"	
14	"	"	
39	"	"	
51	"	"	
51	Lychas marmoreus		
	Diplopoda		
2	Cambalidae	~~Forests Dept~~ W.A.M.	Mr P.M. Johns
	Atelomastix nigrescens Attems 1911		Zoology Dept University of Canterbury Christchurch New Zealand

Site and Tube No.	Identification: Taxonomic Group	Lodged with	Duplicate specimens sent to Specialist taxonomist
1	Cambalidae	~~Forests Dept~~ W.A.M.	Mr P.M. Johns Zoology Dept University of Cant Christchurch NEW ZEALAND
3	"	"	"
4	"	"	"
16	"	"	"
17	"	"	"
19	"	"	"
20	Cambalidae Podykipus collinus Attems 1911	"	"
21	Cambalidae	"	"
24	"	"	"
25	"	"	"
29	"	"	"
30	"	"	"
31	"	"	"
32	"	"	"
34	Cambalidae Podykipus leptoiuliodes Attems 1911	"	"
35	Cambalidae Atelomastix n.s.p. A. Johns	"	"
36	Cambalidae Atelomastix n.s.p. B. Johns	"	"

Site and Tube No.	Identification: Taxonomic Group	Lodged with	Duplicate specimens sent to Specialist taxonomist
18	Polyzonidae	~~Forests Dept~~ W.A.M.	Mr P.M. Johns Zoology Dept University of Canterbu Christchurch NEW ZEALAND
24	Polyzonidae Rhinotus sp	"	"
26	Polyzondae	"	"
30	Polyzonidae Siphonotus sp	"	"
31	Polyzonidae	"	"
31	Polyzonidae Siphonotus sp	"	"
	Chilopoda Scolopendridae		Dr R.E. Crabill, jr, Supervisor & Curator, Division of Myriapoda & Arachnida, Department of Entomolog National Museum of Natural History, Smithsonian Institution WASHINGTON D.C. 20560 U.S.A.
	Cormocephalus sp	"	"
	Cryptos sp	"	"
	Cormocephalus sp		
	Cormocephalus sp Cryptos sp Otostingmus sp		
	Cormocephalus sp	"	"
	Cormocephalus sp Cryptos sp Scolopendra sp		
	Cryptos sp	"	"
	Cormocephalus sp Cryptos sp Scolopendra sp		

Site and Tube No.	Taxonomic Group	Lodged with	Duplicate specimens sent to Specialist taxonomist
39 40	Cumbalidae	~~Forests Dept~~ W.A.M.	Mr P.M. Johns Zoology Dept University of Canterbur Christchurch NEW ZEALAND
8	Paradoxosomatidae Antichiropus sp	"	"
11	Paradoxosomatidae	"	"
15	"	"	"
16	"	"	"
20	"	"	"
22	"	"	"
26	"	"	"
20	Paradoxosomatidae Akamptogonus novarae (Humbert & Saussure 1869)	"	"
33	Paradoxosomatidae	"	"
34	"	"	"
35	"	"	"
40	"	"	"
12	Dalodesmidae Sphaerotrichopus sp	"	"
18	Dalodesmidae	"	"
19	"	"	"
20	Dalodesmidae Sphaerotrichopus sp	"	"
21	Dalodesmidae	"	"
24	"	"	"
30	"	"	"
31	"	"	"
33	"	"	"
34	Dalodesmidae Sphaerotrichopus n.sp Johns	"	"

Site and Tube No.	Taxonomic Group	Lodged with	Duplicate specimens sent to Specialist taxonomist
18	Polyzonidae	~~Forests Dept~~ W.A.M.	Mr P.M. Johns Zoology Dept University of Canterbu Christchurch NEW ZEALAND
34	Polyzonidae Rhinotus sp	"	"
36	Polyzondae	"	"
20	Polyzonidae Siphonotus sp	"	"
21	Polyzonidae	"	"
21	Polyzonidae Siphonotus sp	"	"
	Chilopoda		Dr R.E. Crabill, jr, Supervisor & Curator, Division of Myriapoda & Arachnida, Department of Entomolog National Museum of Natural History, Smithsonian Institution WASHINGTON D.C. 20560 U.S.A.
	Scolopendridae		
	Cormocephalus sp	"	"
	Cryptos sp	"	"
	Cormocephalus sp		
	Cormocephalus sp Cryptos sp Otostigmus sp		
	Cormocephalus sp	"	"
	Cormocephalus sp Cryptas sp Scolopendra sp		
	Cryptos sp	"	"
	Cormocephalus sp Cryptos sp Scolopendra sp		

Identification		Lodged with	Duplicate specimens sent to Specialist taxonomist
te and be No.	Taxonomic Group		
9	Cormocephalus sp Otostigmus sp Scolopendra sp	~~Forests Dept~~ W.A.M.	Dr R.E. Crabill, jr Supervisor & Curator Division of Myriapoda & Arachnida Department of Entomology National Museum of Natural History Smithsonian Institution WASHINGTON D.C. 20560 U.S.A.
0	Cryptos sp	"	
1	Cormocephalus sp Cryptos sp	"	
3	Otostigmus sp Scolopendra sp	"	
2	Cormocephalus	"	"
4	Cormocephalus sp	"	"
6	Cryptos sp	"	"
8	Cryptos sp	"	"
9	Cormocephalus sp Cryptos sp	"	"
0	Cormocephalus sp Cryptos sp	"	"
	Cormocephalus sp Cryptos sp		
	Cormocephalus sp Cryptos sp	"	"
	Cryptos sp		
	Cormocephalus sp Cryptos sp	"	"
	Cormocephalus sp	"	"
	Cormocephalus sp Cryptos sp	"	"
	Cormocephalus sp Cryptos sp	"	"
	Cormocephalus sp	"	"
	Cormocephalus sp		
	Cryptos sp	"	"
	Cormocephalus sp Cryptos sp	"	"

Site and Tube No.	Taxonomic Group	Lodged with	Duplicate specimens sent to Specialist taxonomist
	Identification		
34	Cryptos sp	~~Forests Dept~~ W.A.M.	Dr R.E. Crabill, jr
35	Cormocephalus sp Cryptos sp	"	"
36	Cryptos sp	"	"
39	Cormocephalus sp	"	"
46	Cormocephalus sp Cryptos sp	"	"
	Lithobiidae		
3	Dichelobius sp	"	"
6	Lamyctes sp	"	"
8	Lamyctes sp	"	"
12	Dichelobius sp	"	"
16	Dichelobius sp	"	"
19	Dichelobius sp	"	"
20	Dichelobius sp Lamyctes sp	"	"
22	Lamyctes sp	"	"
24	Dichelobius sp	"	"
25	Dichelobius sp	"	"
27	Dichelobius sp	"	"
28	Dichelobius sp	"	"
31	Dichelobius sp	"	"
32	Dichelobius sp Lamyctes sp	"	"
36	Dichelobius sp Lamyctes sp	"	"
41	Lamyctes sp	"	"

Geophilidae

These were not identified to species level. Chilopoda and duplicate samples have been sent to the Institution. Tube and site numbers are 1, 2, 3, 4, 5, 7, 10, 12, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, 38, 41, ...

Scutigeridae

Site and Tube No.	Taxonomic Group **Identification**	Lodged with	Duplicate specimens sent to Specialist
6	Allotheura maculata	~~Forests Dept~~ W.A.M	Dr C... Institution
16	"	"	
17	"	"	
22	"	"	

Oniscoidea

1	C...	
	Buddenbrockia spp + Dendrogaster sp.	Prof... Laboratoire... Université... Toulouse Laboratoire... Zoologie Faculté des Sciences 118 Route de Narbonne TOULOUSE FRANCE
2	"	"
4	"	"
5	"	"
7	"	"
8	"	"
10	"	"
11	"	"
12	"	"
13	"	"
14	"	"
15	"	"
18	"	"
19	"	"
20	"	"
21	"	"
22	"	"
23	"	"
24	"	"
25	"	"
26	"	"
27	"	"
28	"	"
29	"	"
30	"	"
31	"	"
32	"	"
33	"	"
34	"	"
35	"	"
36	"	"
37	"	"
38	"	"
39	"	"
40	"	"
41	"	"

Identification		Lodged with	Duplicate specimens sent to specialist taxonomists
Site and Tube No.	Taxonomic Group		
6	Philoscia spps	~~Horsens Dept.~~ W.A.M.	Prof.Dr.A. Vandel University de Toulouse
22	"	"	"
26	"	"	"
32	"	"	"
35	"	"	"
Porcellionidae			
35	Porcellio sp	"	"
36	"	"	"
46	Porcellio laevis	"	"
Styloniscidae			
19	Styloniscus sp 1	"	"
20	"	"	"
21	"	"	"
24	"	"	"
27	"	"	"
19	Styloniscus sp 2	"	"
21			
Armadillidae			
46	Armadillidium vulgare	"	"
	Buddelundia spp	"	"
	"	"	"
	"	"	"
	"	"	"
	"	"	"
	"	"	"
	"	"	"
	"	"	"
	"	"	"

Identification		Lodged with	Duplicate specimens sent to specialist taxonomist
Site and Tube No.	Taxonomic Group		
20	Cubaris wilsmorei	~~Forests Dept~~	Prof. Dr... Vandel University de Toulouse
21	"	"	
24	"	"	"
25	"	"	"
34	"	"	"

Amphipoda

These were not identified, the whole samples are lodged in the ~~Forest~~ W.A.M. ~~Department~~ in tubes number: 1,2,4,16,20,21,24,25,27,28,29,30,31,32,33, 4,35,36.

Oligochaeta

The complete collections of Oligochaeta (tubes 1-41 not including 8,11,12, 3,14,15,32,37,38) have been sent to:

Dr B. Jamieson
Dept of Zoology
St Lucia
BRISBANE QUEENSLAND 4067

Insects

The whole insect collection tubes 1-36, has been sent, except for the ants,

Dr M. Upton
C.S.I.R.O.
Division of Entomology
P.O. Box 109
CANBERRA CITY A.C.T. 2601

The whole ant collection has been sent (tubes 1-42 not including 13,23,24, 30,31,37,38,40) to

Dr R. Taylor
C.S.I.R.O.
Division of Entomology
P.O. Box 109
CANBERRA CITY A.C.T. 2601

The whole spider collection (tubes 1-36 excluding 7.15) has been sent to:

Mr T. Gray
Dept of Entomology
Australian Museum
College St. SYDNEY N.S.W. 2000

Site and Tube No.	Taxonomic Group	Lodged with	Duplicate specimens sent to Specialist taxonomist
	Gastropoda Slugs and Snails	Whole collection lodged in ... Museum	
2	Bothriembryon sp	Specialist taxonomist G.M. Kendrick W.A. Museum Dept of Palaeontology	
7	limacid slugs		
8	limacid slugs		
2	limacid slugs		
6	Bothriembryon sp		
7	Luinodiscus sp		
8	Luinodiscus sp		
	Pernagera sp		
	Austrosuccinea sp		
9	Austrosuccinea sp		
	Pernagera sp		
0	Annoselix dolosa Iredale 1939		
	Oxychilus sp		
4	Austrosuccinea sp		
	Pernagera sp		
	Annoselix dolosa		
5	Annoselix dolosa		
	Luinodiscus sp		
	limacid slug		
6	Austrosuccinea sp		
8	Annoselix dolosa		
	Luinodiscus sp		
9	Pernagera sp		
2	Pernagera sp		
9	Oxychilus sp		
4	Oxychilus sp		

Site and Tube No.	Taxonomic Group	Lodged with	Duplicate specimens sent to Specialist taxonomist
36	Luinodiscus sp		
46	Pernagera sp		
49	Westralaoma sp		
51	Bothriembryon sp		
	Onychophora	~~Forests Dept~~ W.A.M	No specialist
24	Peripatoides occidentalis	"	"
26	"	"	"
36	"	"	"
	Terricola Geoplana sp?		
1	brown form	"	"
2	"	"	"
16	"	"	"
18	"	"	"
1	striped form	"	"
16	"	"	"
17	"	"	"
24	"	"	"
27	"	"	"
18	yellow form	"	"
19	"	"	"
20	"	"	"
24	"	"	"
27	"	"	"
	Phalangidae		
5	Laniatores	"	"
12	"	"	"
21	"	"	"
23	"	"	"
24	"	"	"
27	"	"	"

Identification		Lodged with	Duplicate specimens sent to Specialist taxonomist
Site and Tube No.	Taxonomic Group		
28	Phalangidae		
28	Laniatores	~~Forests Dept~~ W.A.M.	No specialist
29	"	"	"
31	"	"	"
32	"	"	"
33	"	"	"
34	"	"	"
36	"	"	"
29	Palpatores	"	"

Addenda to Faunal List.

As reports from specialists arrive it will be necessary to up date the list. Additions and corrections received since the report was typed are -

Millipedes identified by P.M. Johns.

Cambalidae
Samichus attemsi Verhoeff 1944 site 20

Marri mixed forest

Dalodesmidae.

New genus, new species collected from the Warren National Park in deep Karri forest, unburnt with a thick Casurina understorey.

Oniscoidea - identified by Prof. A. Vandel

Eurygastor sp.	site 1.
Laevophiloscia sp.	site 7
Sphaerilloides sp.	site 8
Buddelundia monticola B.L.	site 12
Philosciidae	site 18

Styloniscus australiensis Vandel site 21.

this is a new species from the Karri mixed forest.

Pemberton HU61. The description is not yet published but the type is in the West Australian Museum.

Australoniscus springetti. Vandel site 36

this is a new species from Karri litter in the Porongurups. The description is not yet published but the type is in the West Australian Museum.

Hanoniscus nicholllsi Bowley site 34

Buddelunda sp. site 38

Porcellio laevis site 45

Laureola wilsmorei (Nicholls and Barnes) site 25

this is the genus into which Vandel has placed Cubaris wilsmorei Nicholls and Barnes and which is also lodged in the W.A. Museum as C. wilsomeri and Ackermania sp.

Araneae

Descriptions of new species of the genus Stanwellia are in press B.T. Main, Jour. Roy. Soc. West. Aust.

APPENDIX I

Site No.	Locality	Description	
1	Gleneagle BL68 32°15"S 116°15"E	Mr Havel's plot 166	Rich alluvium Euc.pate
2	Gleneagle BL67 32°15"S 116°10"E	Mr Havel's plot 169	Rich immature soil on steep bank.
3	Gleneagle BO68	Next to Mr Havel's plot 50	Poor, dry Jarrah
4	Gleneagle BO68	Mr Havel's plot 171	Black swamp soil Bullich (E.megacarpa)
5	Gleneagle BY76	Mr Havel's plot 86	Leached grey sand
6	Gleneagle BU72	Mr Havel's plot 72	Red sandy loam over impervious iron pan.
7	Gleneagle BV72	Mr Havel's plot 64	Sandy gravel - Jarrah
8	Gleneagle BS86	No plot number	Wandoo on basic loam
9	Gleneagle BT86	No plot number	Eastern Blackbutt on sand
10	Gleneagle BS86	No plot number	Jarrah on deep lateri
11	Gleneagle BP80	Mr Havel's plot 106	Yellow sand
12	Mundaring AW71 32° 116 20'	Mr Havel's plot 136	Wandoo on red gravel
13	Mundaring AY77	Mr Havel's plot 24	Blackbutt on poor sa
14	Mundaring BA81	Mr Havel's plot 27	Wandoo on rich alluv
15	Mundaring BB87	Mr Havel's plot 3	No trees, leached gre sand
16	Dwellingup CX71 Ampion 6 132°45' 116°10'	Jarrah on laterite	Unburnt 40 years
17	Dwellingup CY71	Jarrah on laterite rotational burn due 197	

Site No.	Locality	Description
18	Manjimup GY55 (HB.53.94.) Gray. 34°15'S 116°E	Pine Creek Rd. Karri and waterbush. Felled and burnt 1967. Natural regen. coarse red gravel.
19	Manjimup GY55 (HB.54.24.) Gray	Pine Creek Rd. Virgin Karri and scattered Casurina and waterbush. Thick bark litter over fine red gravel.
20	Pemberton HV61	Marri mixed forest - Casurina, Agonis, grasses bracken over yellow-grey gravel (podzol) P. Christensen's trap line.
21	Pemberton HU61 34°30'S 116°E	Karri mixed forest scattered Casurina grasses, bracken - brown-red gravel fine P. Christensen's trap line control.
22	Pemberton HU62	Allis Rd. Blackboys over grey sand.
23	Manjimup GV71	Black peat sand Paperbarks and Jarrah.
24	Pemberton HL62 Big Brook 12	Pole Karri 40 yrs. Casurina and bracken Red gravel. Unburnt
25	Pemberton HL61 Big Brook 40	Pole Karri 40 yrs. Red gravel Aerial burn 1970
26	Shannon HP81 Sutton block	March Rd. Original Marri-Karri mix on yellow gravel. Felled, not burnt 1968. Regenerated with Karri seed trees only. Very few Marri.
29,27	Pemberton HV64 34°30'S 115°05'E	Marri Rd Red earth - Karri
30	Pemberton HV64 34°30'S 115°05'E	Marri Rd Grey alluvium
28	Pemberton HV64 34°30'S 115°05'E	Marri Rd Grey Podzol Karri-Marri
32	Manjimup 34°15'S 116°15E	Karri-Acacia
33	Pemberton-Manjimup 34°15'S 116°15'E	Karri bark

Site No.	Locality	Description
34	Pemberton HQ58 34°25'S 115°55'E	Warren National Park Karri-Casuarina
35	35°S 117°56'E	2 Peoples Bay. Mt Gardiner Bullich
36	34°40'S 117°50'E	Porongorups
37	26°30'S 113°40'E	Hamelin Pool
38	27°40'S 115°40'E	Murchison River, Granite boulders
39	Gleneagle BL68	Canning Catchment - Casuarina
40	Gleneagle BL68	Bedfordale - CSIRO orchards and Jarrah
41	33°S 115°44'E	Tuart Ludlow
42	33°S 115°44'E	Pines Ludlow
45	Metropolitan area - gardens Perth W.A.	Com[illegible] rests Dept Como, Todd Ave. C[illegible]ach, University Zoology Dept.
46	Pemberton HN55 34°25'S 115°55'E	Beedalup Falls
47	Gleneagle BL68	Gleneagle Pines
48	Manjimup	Mt Wellington P. radiata
49	33°35'S 115°50'E	Donnybrook Jarrah
50	33°35'S 115°50'E	Donnybrook Orchards
51	31°50'S 115°50'E	Gnangara pitfall traps Southern Pasture comp
52		Dwellingup Jarrah
52		Millstream

SITE	% N	% C	K^+ me/l	K^+ me%	Na^+ me/l	Na^+ me%	Phosphates ppm per ml	Total K^+ me/l	Total K^+ %K	Cation exchange capacity me%	Ca ppm	Ca %	Mg ppm	Mg %	Soil Moisture loss on Ignition	Specific Conductivity	Total soluble salts.	pH
1	0·165	3·89	0·016	0·16	0·004	0·04	99·925	0·95	0·037	20·42	10·5	5·25	0·58	2·38	1·26	0·0368	0·0138	6·25
2	0·275	7·31	0·042	0·42	0·02	0·20	190·82	1·15	0·045	34·44	14·3	14·27	0·53	4·40	2·51	0·0494	0·0185	6·25
3	0·071	4·78	0·012	0·12	0·014	0·14	19·77	0·30	0·012	19·08	9·2	4·59	0·48	1·97	1·21	0·0352	0·0132	5·60
4	0·176	6·96	0·030	0·30	0·042	0·42	138·75	0·65	0·025	42·18	14·4	7·18	0·70	2·88	1·86	0·0586	0·0220	5·90
5	0·031	2·67	0·002	0·02	0·004	0·04	15·65	0·45	0·017	16·14	3·8	1·89	0·19	0·78	0·36	0·0127	0·0048	5·80
6	0·091	3·22	0·014	0·14	0·02	0·20	49·52	0·80	0·031	27·95	5·4	2·69	0·81	3·33	1·20	0·0231	0·0087	6·13
7	0·063	2·93	0·014	0·14	0·002	0·02	10·67	0·80	0·031	17·68	5·7	2·84	0·31	1·29	0·81	0·0241	0·0090	6·18
8	0·150	5·10	0·046	0·46	0·014	0·14	90·00	3·40	0·133	25·53	15·8	7·88	0·49	2·01	1·40	0·0354	0·0133	6·22
9	0·050	2·15	0·014	0·14	0	0	74·32	0·70	0·027	16·99	10·1	5·04	0·33	1·35	0·48	0·0238	0·0089	6·50
10	0·162	7·39	0·012	0·12	0·004	0·04	15·65	0·50	0·019	23·95	17·6	8·78	0·57	2·34	1·68	0·0494	0·0185	6·00
11	0·061	4·35	0·018	0·18	0·01	0·10	19·77	0·50	0·019	14·88	6·9	3·44	0·32	1·33	0·83	0·0238	0·0089	6·08

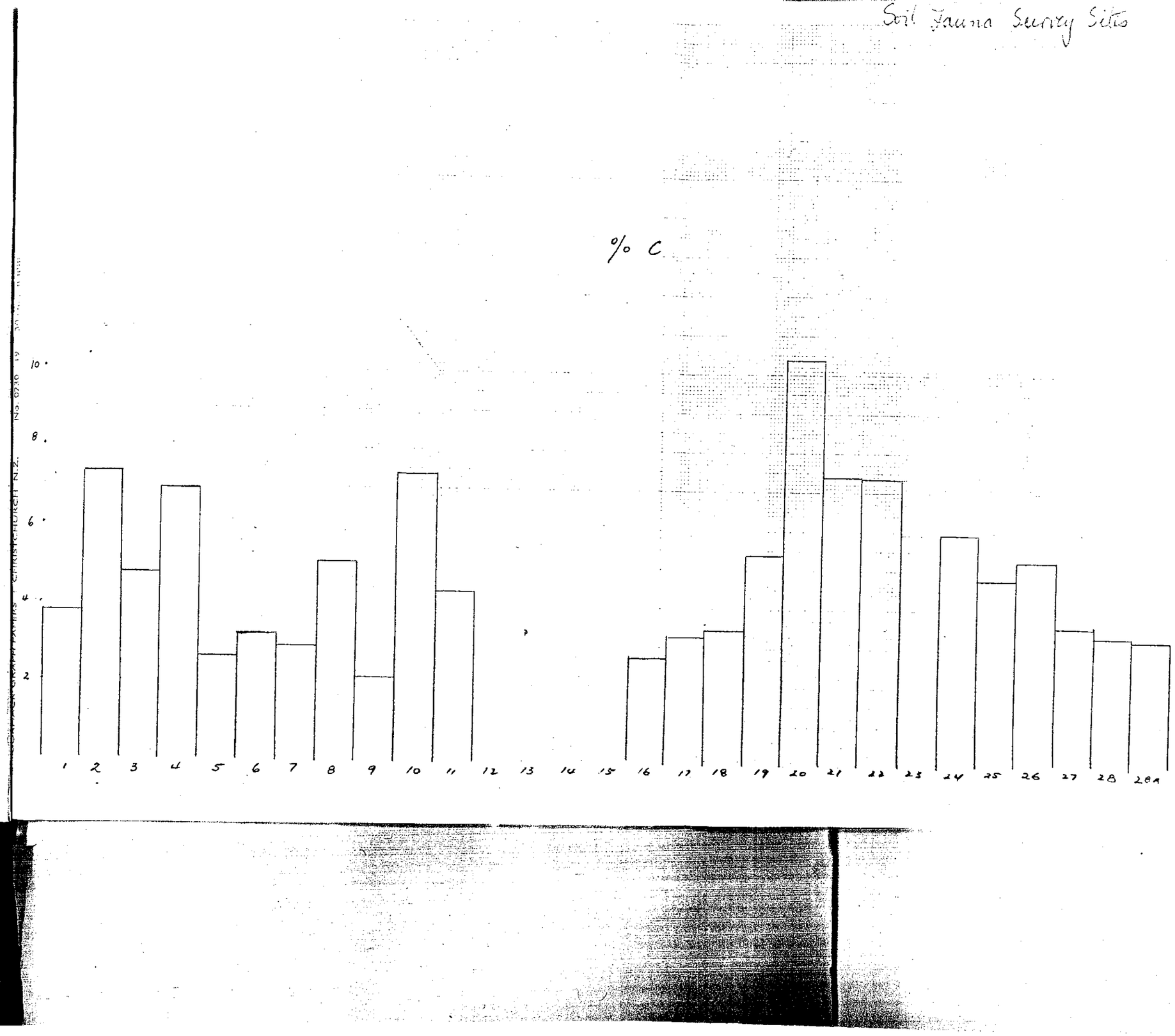
Insect Collection Sites.

	% N.	% C.	K^+ me/l	K^+ me%	Na^+ me/l	Na^+ me%	Phosphates. ppm per ml.	Total K^+ me/l	Total K^+ % K.	Cation exchange capacity me%	Ca ppm	Ca %	Mg ppm	Mg %	Soil Moisture loss on Ignition.	Specific Conductivity.	Total soluble salts.	pH.
18	0.184	3.46	0.048	0.48	0.069	0.68	212.28	2.90	0.113	12.08	23.5	46.9	0.980	8.059		0.201	0.075	7.56
19	0.247	5.38	0.056	0.56	0.036	0.36	68.52	3.20	0.125	24.62	9.0	8.982	0.320	2.631		0.166	0.062	6.80
20	0.546	10.39	0.02	0.20	0.020	0.20	46.20	0.90	0.035	18.39	2.0	1.996	0.210	1.727		0.118	0.044	5.17
21	0.334	7.40	0.028	0.28	0.024	0.24	104.05	1.40	0.055	24.13	10.5	10.479	0.315	2.59		0.139	0.052	6.55
* 23 missing.																		
22	0.277	7.34	0	0	0.020	0.20	2.42	0.35	0.014	18.51	0.70	0.698	0.130	1.069		0.059	0.022	4.72
24	0.277	5.94	0.011	0.11	0.016	0.16	189.15	0.80	0.031	24.30	11.70	11.676	0.258	2.122		0.120	0.045	6.95
	0.187	4.76	0.003	0.08	0.016	0.16	89.15	0.80	0.031	16.02	13.30	13.273	0.205	1.656		0.130	0.049	7.52
21	0.[illegible]	5.27	0.02	0.2	0.016	0.16	148.70	0.80	0.031	14.42	5.0	4.990	0.190	1.224		0.064	0.024	6.42
27	0.159	3.59	0.016	0.16	[illegible]	.14	28.02	0.30	0.012	12.14	4.8	4.79	0.195	1.604		0.085	0.032	6.70
28	0.121	2.85	0.0	0.0	0.008	0.08	87.52	0.15	0.006	6.77	1.0	0.998	0.035	0.699		0.038	0.014	6.00
[illegible]	0.083	3.27	0	0	0.008	0.08	185.85	0	0.	9.71	0.8	0.798	0.046	0.207		0.017	0.006	5.33
	✓	✓					✓								✓			✓
															% gravel.			
[illegible] 16	0.095	2.74	0.04		0.09		57		0.008	6.42	5.0	2.49	0.18	0.74	44.	0.032	0.012	5.6
[illegible] 17.	0.119	3.30	0.07		0.09		49		0.011	10.02	6.5	3.24	0.24	0.99	81	0.026	0.09	5.5

Gravel is attached sheet.

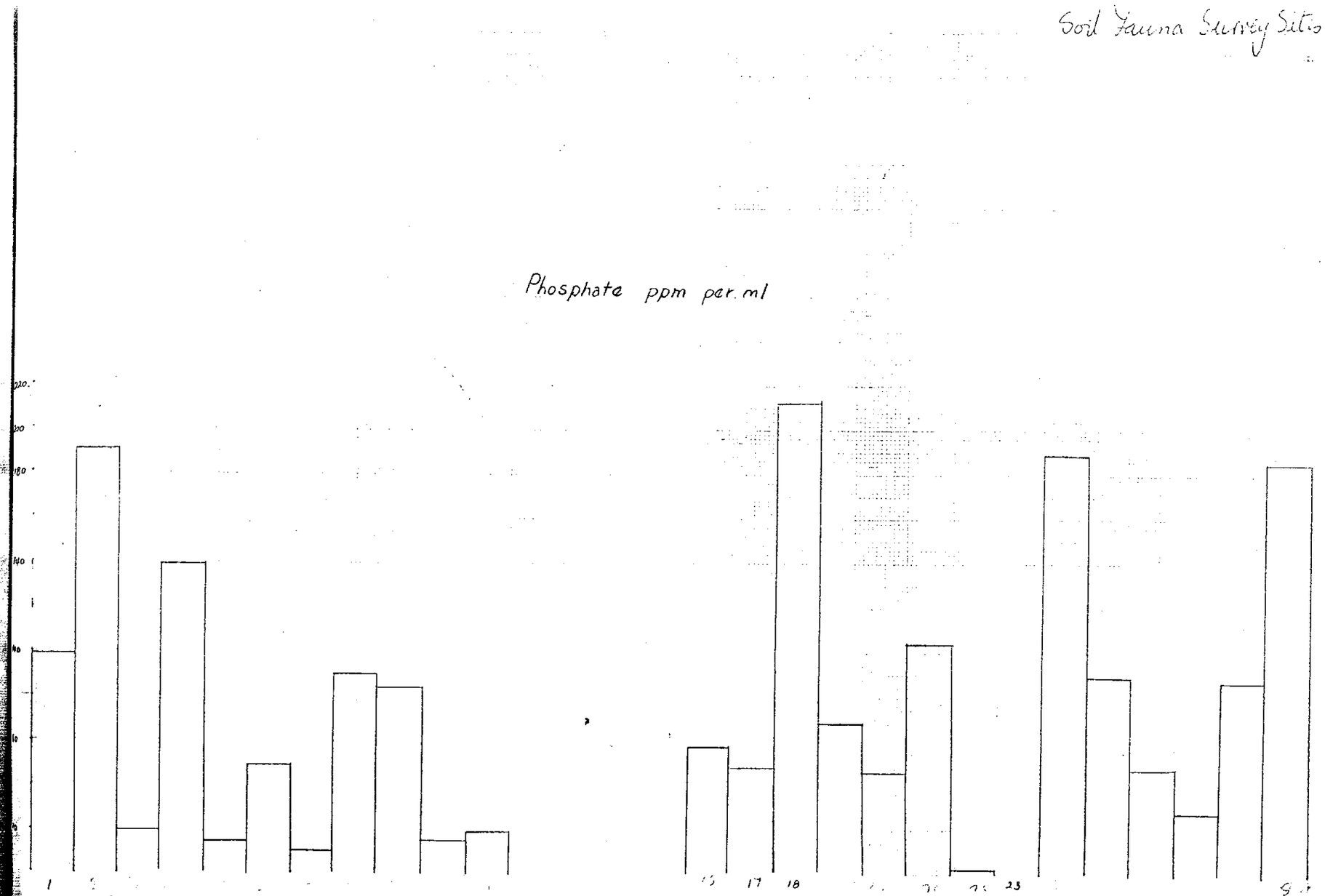
SITE	% N	% C	K^+ me/l	K^+ me%	Na^+ me/l	Na^+ me%	Phosphates ppm per ml	Total K^+ me/l	Total K^+ %K	Cation exchange capacity me%	Ca ppm	Ca %	Mg ppm	Mg %	Soil Moisture loss on Ignition	Specific Conductivity	Total soluble salts.	pH
1	0·165	3·89	0·016	0·16	0·004	0·04	99·925	0·95	0·037	20·42	10·5	5·25	0·58	2·38	1·26	0·0368	0·0138	6·25
2	0·275	7·31	0·042	0·42	0·02	0·20	190·82	1·15	0·045	39·44	14·3	14·27	0·53	4·40	2·51	0·0494	0·0185	6·25
3	0·071	4·78	0·012	0·12	0·014	0·14	19·77	0·30	0·012	19·08	9·2	4·59	0·48	1·97	1·21	0·0352	0·0132	5·60
4	0·176	6·96	0·030	0·30	0·042	0·42	138·75	0·65	0·025	42·18	14·4	7·18	0·70	2·88	1·86	0·0586	0·0220	5·90
5	0·031	2·67	0·002	0·02	0·004	0·04	15·65	0·45	0·017	16·14	3·8	1·89	0·19	0·78	0·36	0·0127	0·0048	5·80
6	0·091	3·22	0·014	0·14	0·02	0·20	49·52	0·80	0·031	27·95	5·4	2·69	0·81	3·33	1·20	0·0231	0·0087	6·13
7	0·063	2·93	0·014	0·14	0·002	0·02	10·67	0·80	0·031	17·68	5·7	2·84	0·31	1·29	0·81	0·0241	0·0090	6·18
8	0·150	5·10	0·046	0·46	0·014	0·14	90·00	3·40	0·133	25·53	15·8	7·88	0·49	2·01	1·40	0·0354	0·0133	6·22
9	0·050	2·15	0·014	0·14	0	0	74·32	0·70	0·027	16·99	10·1	5·04	0·33	1·35	0·48	0·0238	0·0089	6·50
10	0·162	7·39	0·012	0·12	0·004	0·04	15·65	0·50	0·019	23·95	17·6	8·78	0·57	2·34	1·68	0·0494	0·0185	6·00
11	0·061	4·35	0·018	0·18	0·01	0·10	19·77	0·50	0·019	14·88	6·9	3·44	0·32	1·33	0·83	0·0238	0·0089	6·08

Soil Fauna Survey Sites



Soil Fauna Survey Sites

Phosphate ppm per ml



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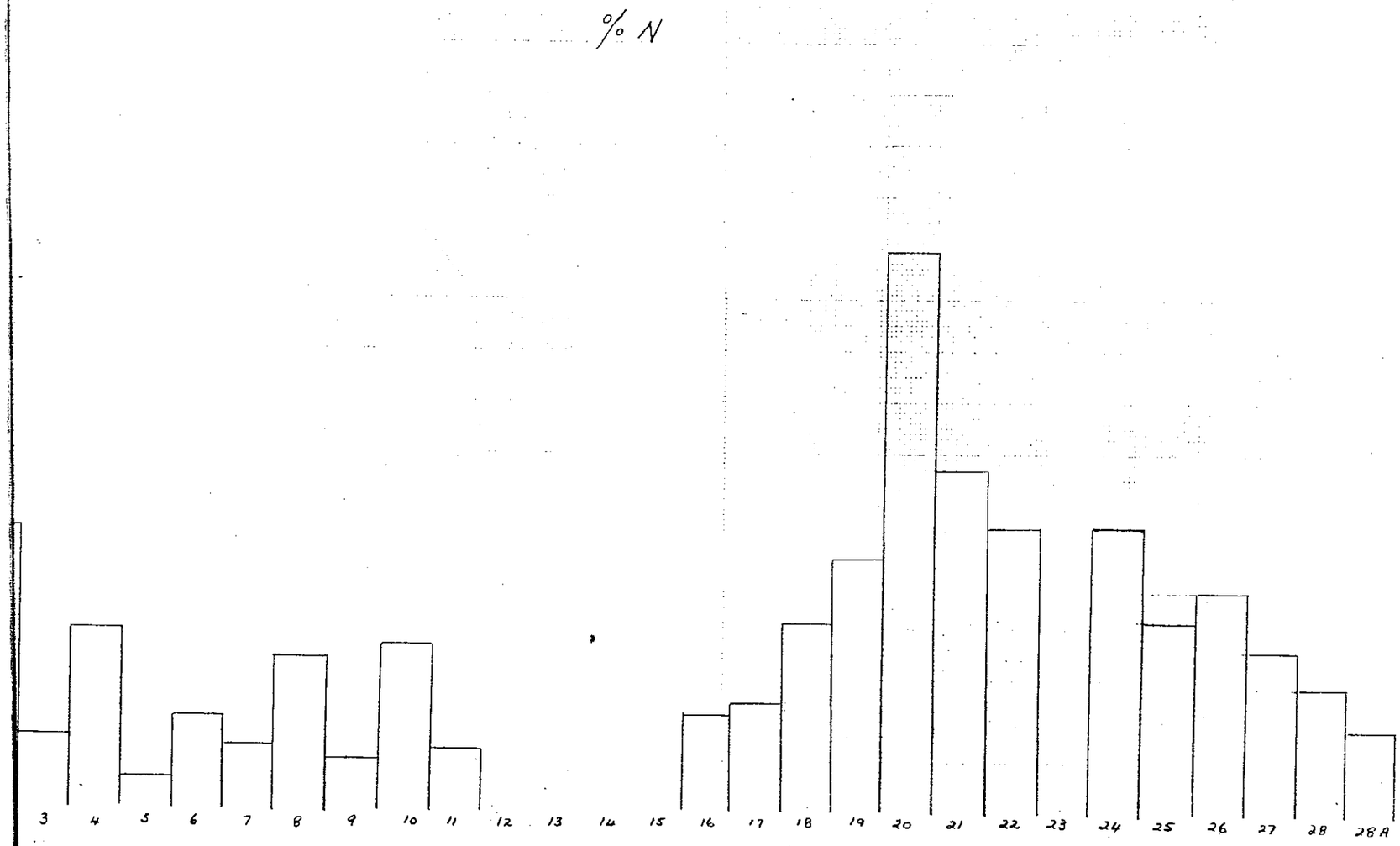

Soil Fauna Survey Sites

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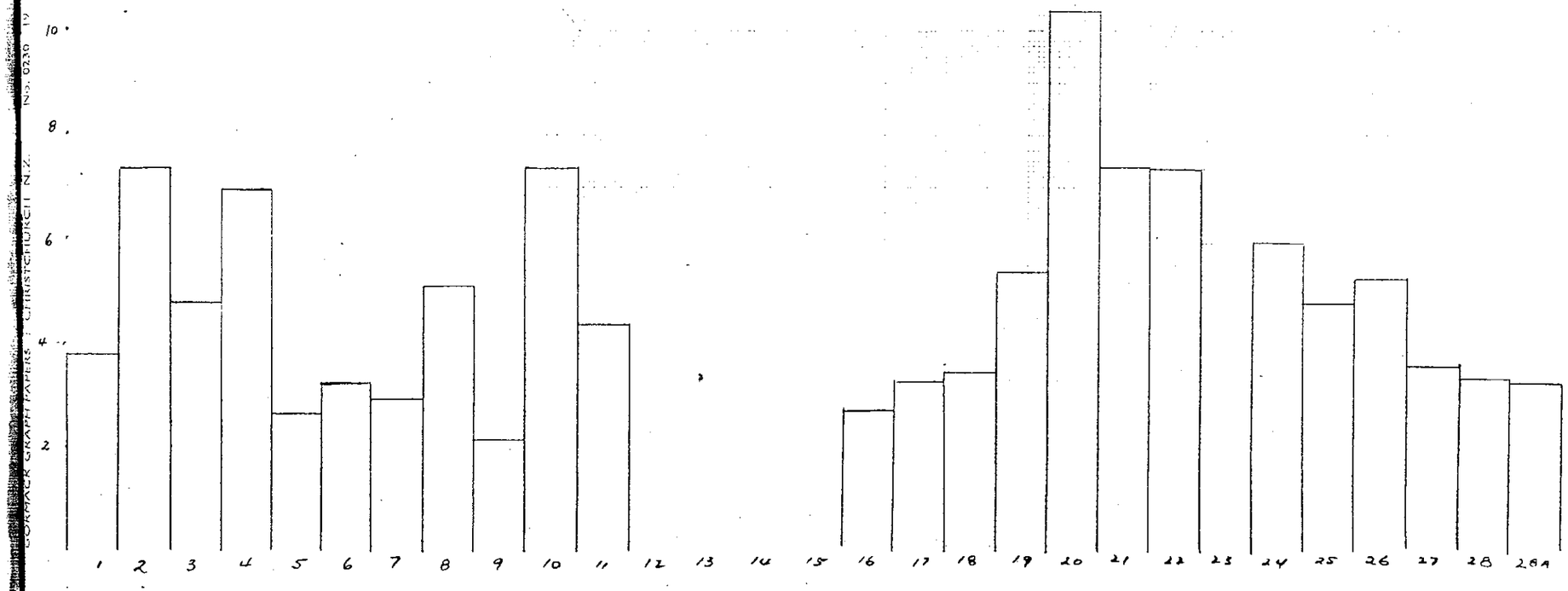
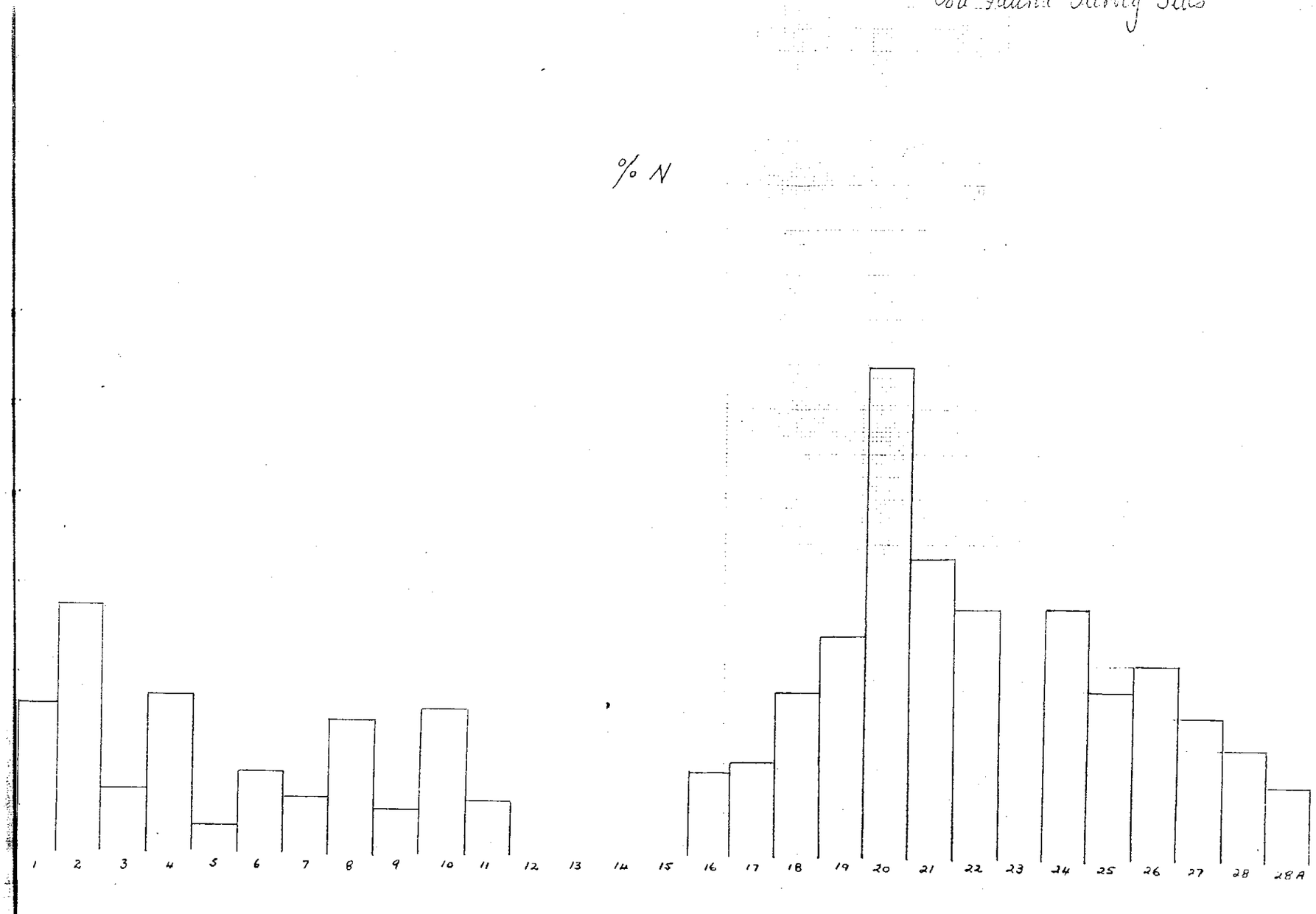


Soil Fauna Survey Sites



44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	– SITE NUMBER.	
																																												1. Urodacus noroholandiae	SCORPIONIDAE
																																												2. Carcophonius sulcatus	
																																												3. Lychas marmoreus	
																																												4. Podykipus sp. & Atelomastix sp.	
																																												5. Antichiropus sp.	
																																												6. Sphaerotrichopus sp. A.	
																																												7. Rhinotus sp.	DIPLOPODA
																																												8. Siphonotus sp. A.	
																																												9. Akamptogonus sp.	
																																												10. Siphonotus sp. B.	
																																												11. Sphaerotrichopus sp.B.	
																																												12. Cormocephalus sp.	
																																												1. Cryptos sp.	
																																												2. Dichelobius sp.	
																																												3. Geophilidae - var 1.	
																																												4. Geophilidae - var 2	CHILOPODA
																																												5. Geophilidae - var 3.	
																																												6. Otostigmus sp.	
																																												7. Allotheura maculata.	
																																												8. Lamyctes sp.	
																																												9. Scolopendra sp.	
																																												10. Laevophiloscia & Eurygastor sp.	
																																												1. Buddelundia sp.	
																																												2. Buddelundia sp.	
																																												3. Philoscia s.lat. sp.	
																																												4. Sphaerilloides sp.	
																																												5. Buddelundia monticola	
																																												6. Buddelundia sp.	
																																												7. Styloniscus australensis	
																																												8. (Cubaris s.lat. sp.) Laureola wilsmorei	
																																												9. Philoscia sp.	
																																												10. Porcellio laevis	ISOPODA
																																												11. Armadillidium vulgare	
																																												12. Oniscoidea & Hanoniscus nichollsi	
																																												13. Australoniscus springetti	
																																												14. Porcellio sp.	
																																												15. Philoscia s.lat. sp.	
																																												16. Philoscia s.lat. sp.	
																																												17. Philoscia s.lat. sp.	
																																												18. Philoscia s.lat. sp.	
																																												19. Philoscia s.lat. sp.	
																																												20. Styloniscus sp.	
																																												21. Buddelundia sp.	
																																												22. Buddelundia sp.	
																																												1. Parorchestia sp.	AMPHIPODA
																																												1. Oligochaeta ADULTS LESS THAN 40MM	OLIGOCHAETA
																																												2. Oligochaeta ADULTS MORE THAN 40MM.	
																																												1. Lycosa sp.	
																																												2. Lycosidae	
																																												3. Oxyopidae	
																																												4. Salticidae	
																																												5. Dipneumonomorphae	

53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SITE NUMBER.
11																																																				1. Urodacus noroholandiae
4																																																						2. Carcophonius sulcatus
1																																																					3. Lychas marmoreus
20																																																					4. Podykipus sp. & Atelomasi
7																																																				5. Antichiropus sp.
10																																																					6. Sphaerotrichopus sp. A.
3																																																				7. Rhinotus sp.
2																																																					8. Siphonotus sp. A.
6																																																					9. Akamptogonus sp.
1																																																					10. Siphonotus sp. B.
1																																																					11. Sphaerotrichopus sp.B.
24																																																					12. Cormocephalus sp.
23																																																					13. Cryptos sp.
12																																																					14. Dichelobius sp.
11																																																					15. Geophilidae - var 1.
34																																																					16. Geophilidae - var 2
2																																																					17. Geophilidae - var 3.
3																																																					7. Otostigmus sp.
4																																																					8. Allotheura maculata.
7																																																					9. Lamyctes sp.
4																																																					10. Scolopendra sp.
18																																																					1. Laevophiloscia & Eurygas
1																																																				2. Buddelundia sp.
1																																																				3. Buddelundia sp.
1																																																				4. Philoscia s.lat. sp.
1																																																				5. Sphaerilloides sp.
3																																																				6. Buddelundia monticola
1																																																				7. Buddelundia sp.
1																																																				8. Styloniscus australensi
5																																																				9. (Cubaris s.lat. sp.) Laure
5																																																			10. Philoscia sp.
1																																																				11. Porcellio laevis
1																																																				12. Armadillidium vulgare
1																																																				13. Oniscoidea & Hanonis
1																																																				14. Australoniscus spring
1																																																				15. Porcellio sp.
1																																																				16. Philoscia s.lat. sp.
1																																																				17. Philoscia s.lat. sp.
1																																																				18. Philoscia s.lat. sp.
1																																																				19. Philoscia s.lat. sp.
2																																																				20. Styloniscus sp.
1																																																				21. Buddelundia sp.
1																																																				22. Buddelundia sp.
19																																																				1. Parorchestia sp.
15																																																				2. Oligochaeta ADULTS LESS
18																																																			3. Oligochaeta ADULTS MORE
7																																																			1. Lycosa sp.
24																																																			2. Lycosidae
10																																																		3. Oxyopidae
6																																																		4. Salticidae
																																																	5. Dipneumonomorpha

4. Salticidae
5. Dipneumonomorpha
6. Chenistoria sp.
7. Stanwellia sp.
8. Ctenizidae
9. Clubiinidae
10. Miturga sp.
11. Dipneumonomorpha
12. Dipneumonomorpha
13. Dipneumonomorpha
14. Thomisidae
15. Gnaphosidae
16. Gnaphosidae
17. Drassidae
18. Dipneumonomorpha
19. Dipneumonomorpha
20. Dipneumonomorpha
21. Argiopidae
22. Theridiidae
23. Ctenidae

ARANAEIDA

1. Formicinae
2. Ponerinae
3. Formicinae
4. Myrmicinae
5. Formicinae
6. Ponerinae
1 Ponerinae
8. Myrmicinae
9. Formicinae
10. Dolichoderminae
11. Dolichoderminae
12. Dolichoderminae
13. Dolichoderminae
14. Myrmicinae
15. Ponerinae
15. Myrmicinae
17. Ponerinae
18. Ponerinae
19. Ponerinae
20. Formicinae
21. Myrmicinae
22. Formicinae

FORMICINAE

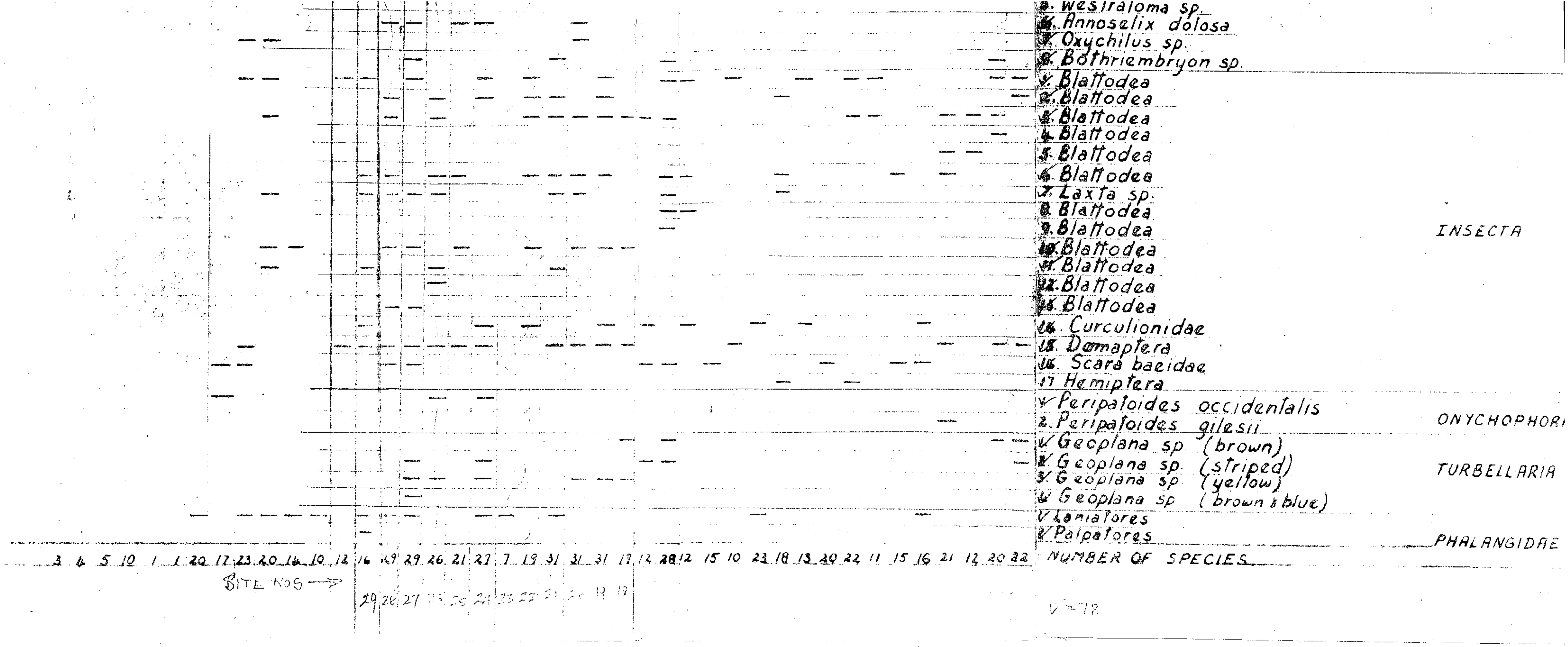
1. Limacidae
2. Austrosuccinea sp.
3. Pernagera sp.
4. Luinodiscus sp.
5. Westraloma sp.
6. Annoselix dolosa
7. Oxychilus sp.
8. Bothriembryon sp.

GASTEROPODA

1. Blattodea
2. Blattodea
3. Blattodea
4. Blattodea
5. Blattodea
6. Blattodea
7. Laxta sp.
8. Blattodea
9. Blattodea

INSECTA

24
10 — 1. Salticidae
6 — 5. Dipneumonomorpha
5 — 6. Chenisforia sp.
11 — 7. Stanwellia sp.
7 — 8. Ctenizidae
2 — 9. Clubiinidae
23 — 10. Miturga sp.
5 — 11. Dipneumonomorpha
4 — 12. Dipneumonomorpha
1 — 13. Dipneumonomorpha
5 — 14. Thomisidae
2 — 15. Gnaphosidae
6 — 16. Gnaphosidae
2 — 17. Drassidae
2 — 18. Dipneumonomorpha
5 — 19. Dipneumonomorpha
1 — 20. Dipneumonomorpha
1 — 21. Argiopidae
4 — 22. Theridiidae
2 — 23. Ctenidae
1 — 1. Formicinae
15 — 2. Ponerinae
10 — 3. Formicinae
4 — 4. Myrmicinae
6 — 5. Formicinae
8 — 6. Ponerinae
7 — 7 Ponerinae
3 — 8. Myrmicinae
1 — 9. Formicinae
5 — 10. Dolichoderminae
2 — 11. Dolichoderminae
4 — 12. Dolichoderminae
15 — 13. Dolichoderminae
3 — 14. Myrmicinae
2 — 15. Ponerinae
6 — 15. Myrmicinae
1 — 17. Ponerinae
6 — 18. Ponerinae
2 — 19. Ponerinae
4 — 20. Formicinae
7 — 21. Myrmicinae
5 — 22. Formicinae
2 — 1. Limacidae
6 — 2. Austrosuccinea sp.
4 — 3. Pernagera sp.
6 — 4. Luinodiscus sp.
5 — 5. Westraloma sp.
1 — 6. Annoselix dolosa
5 — 7. Oxychilus sp.
3 — 8. Bothriembryon sp.
5 — 1. Blattodea
16 — 2. Blattodea
8 — 3. Blattodea
15 — 4. Blattodea
1 — 5. Blattodea
2 — 6. Blattodea
13 — 7. Laxta sp.
9 — 8. Blattodea
9. Blattodea



Westraloma sp.
Annoselix dolosa
Oxychilus sp.
Bothriembryon sp.
1. Blattodea
2. Blattodea
3. Blattodea
4. Blattodea
5. Blattodea
6. Blattodea
7. Laxta sp.
8. Blattodea
9. Blattodea
10. Blattodea
11. Blattodea
12. Blattodea
13. Blattodea
14. Curculionidae
15. Dermaptera
16. Scarabaeidae
17 Hemiptera
INSECTA
1. Peripatoides occidentalis
2. Peripatoides gilesii
ONYCHOPHORA
1. Geoplana sp. (brown)
2. Geoplana sp. (striped)
3. Geoplana sp. (yellow)
4. Geoplana sp. (brown & blue)
TURBELLARIA
Laniatores
Palpatores
PHALANGIDAE
3 6 5 10 1 1 20 17 23 20 16 10 12 16 29 29 26 21 27 7 19 31 31 31 17 12 28 12 15 10 23 18 13 20 22 11 15 16 21 12 20 32
NUMBER OF SPECIES
BITE NOS →
29 26 27 28 25 24 23 22 21 20 19 17
√ = 78

5	8. Westraloma sp.
1	14. Annoselix dolosa
5	7. Oxychilus sp.
3	8. Bothriembryon sp.
5	1. Blattodea
16	2. Blattodea
8	3. Blattodea
15	4. Blattodea
1	5. Blattodea
2	6. Blattodea
13	7. Laxta sp.
9	8. Blattodea
2	9. Blattodea
1	10. Blattodea
9	11. Blattodea
4	12. Blattodea
1	13. Blattodea
2	14. Curculionidae
9	15. Dermaptera
16	16. Scarabaeidae
10	17 Hemiptera
2	1. Peripatoides occid
3	2. Peripatoides gilesi
1	1. Geoplana sp (brow
4	2. Geoplana sp (strip
5	3. Geoplana sp (yello
6	4. Geoplana sp (brow
1	1. Laniatores
13	2. Palpatores
1	

1 3 3 2 6 2 3 4 5 10 1 1 20 12 23 20 14 10 12 16 29 29 26 21 27 7 19 31 31 31 17 12 28 12 15 10 23 18 13 20 22 11 15 16 21 12 20 32 NUMBER OF SPECIES

SITE NOS →

29 26 27 25 24 23 22 21 20 19 17

V = 78