11 APPENDIX : COMPARISON OF THE MESOFAUNA EXTRACTED BY THE FUNNEL- AND GREASE FILM METHOD

In the chapter concerning the methods employed during this investigation, it has already been mentioned that the samples were at first subjected to extraction by the Berlese funnel method, then preserved, and finally re-extracted by grease film method. It is therefore evident that there is no question of a direct or parallel comparison of the effectivity of the two extraction methods for the different groups. Nevertheless, the ultimate comparison of the results obtained from the extractors justified an investigation of the efficiency of the two methods employed.

THE MESOFAUNA

In the course of the analysis of the mesofaunal numbers extracted by the two methods, it became clear that those plots from which comparatively high Acari numbers and especially Trombidiformes numbers were recorded, higher numbers were extracted by the funnel method. As depicted by figure 137, and also in other figures which illustrate the mesofauna, it is evident that the control plot, the biological control plot and the old citrus plot had the highest Acari - and thus the largest funnel extracted numbers of all the investigated plots. Taking biomass into account, it was obvious that in the two plots A and B, where the Acari were in a dominant position and the Collembola in small quantities, the funnel extracted meso-

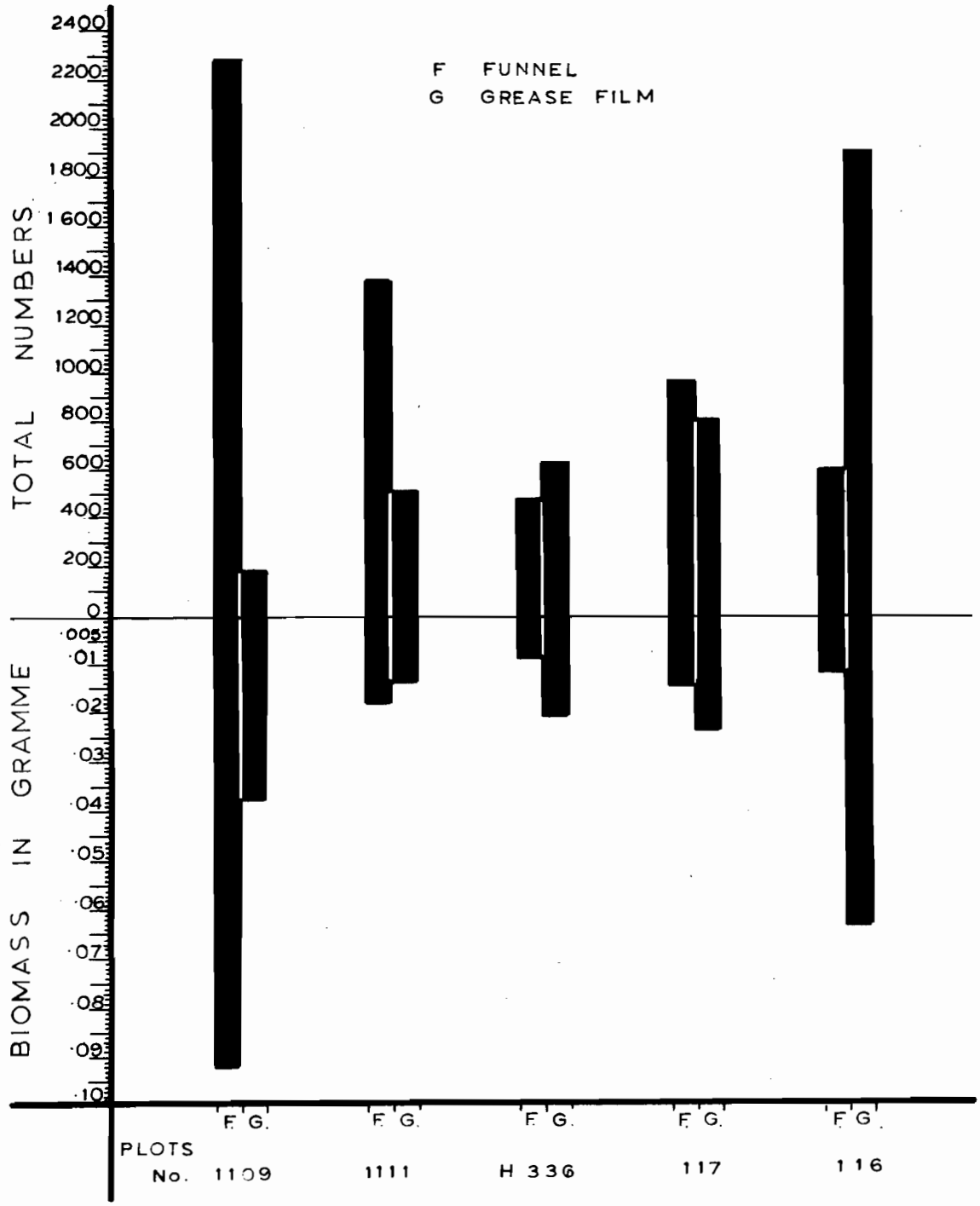

Fig. 137 Comparison of funnel- and grease film extractions of the mesofauna, plots A - E.

fauna still exhibited the largest proportions. However, in the plots where both numbers and biomass values were dominated by Collembola, the grease film method recorded higher extraction values. All the results recorded during the investigation are presented in tables 50 to 74.

THE ACARI

Within the Acari, the order Trombidiformes was mainly extracted by the funnel method, and this was equally true for the Mesostigmata, with the exception of plot B, where higher Mesostigmata numbers were extracted by grease film method. The Oribatei revealed higher numbers in the residual extractions of plots B, D and E.

TROMBIDIFORMES

PLOT A

At the site of the control plot, a total of 1,610 trombidiform mites were extracted by the funnel method. The residual extraction by grease film method proved that only 25 trombidiform mites were left in the cores. The first total represents 70.326% of the total mesofaunal numbers extracted. The grease film extractions recorded 1.092% of the mesofaunal numbers. The equavalent biomass percentages for the abovementioned numbers recorded were 6.566% for the funnels and .105% for the grease film respectively.

PLOT B

The old citrus plot recorded a total numver of 1017 funnel extracted trombidiform mites, which was equal to 53.330% and 10.257% of the total mesofaunal numbers and biomass values respectively. The grease film method recovered a further 24 specimens which represented 1.258% and .414% of the total mesofaunal numbers and biomass values for this particular plot.

PLOT C

The new citrus plot, which had the lowest Trombidiformes numbers of all the plots investigated nevertheless had 25.380% of the total mesofaunal numbers, from the funnel extraction. A further 13 specimens of trombidiform mites were recovered from the residue extractions and represented 1.161% of the total mesofaunal numbers. A biomass value of 2.144% and .170% was recorded for the funnel- and grease film extractions respectively.

PLOT D

This plot, which had the third highest Trombidiform numbers of all the plots investigated, recorded 515 mites, from the funnel method and 12 individuals from the grease film apparatus. In terms of numbers and biomass percentages, the funnels extracted 28.835% and 2.496% against the .672% and .143% of the grease film total mesofaunal values respectively.

PLOT E

The routine plot recorded very low Trombidiformes numbers, with the result that the high collembolan numbers recorded effected low Trombidiformes numbers and biomass percentages. Once again, the funnel method proved to be a good trombidiform extractor with 286 mites extracted by this method against the total residual recovering of 9 trombidiform mites from the grease film.

The results obtained by Aucamp & Ryke (1965) from grease film-funnel extractions, revealed better trombidiform extraction by funnel method. The abovementioned conclusion was manifested by the positive results from all five plots; equally so when the differences of soil nature, and the Trombidiformes population composition of the different plots, were taken in consideration.

MESOSTIGMATA

As the Mesostigmata are predators, their numbers are very small in comparison with the saprophagous part of the mesofauna. In four out of the five plots, the highest numbers were recorded from extractions by the funnel method, indicating that this method is fairly good for Mesostigmata recovery.

The numbers recovered from the two methods employed were:

	Funnel	Grease Film
Plot A	19	7
Plot B	81	12

	Funnel	Grease film
Plot C	12	7
Plot D	17	34
Plot E	23	14

ORIBATEI

The three plots B, D and E attained higher numbers in the residual grease film extraction. An overall total of 663 oribatid mites were extracted from the grease film sections from the five plots in comparison with the 551 mites recovered by funnel method. More than half of these specific mites would have been lost if the grease film method was not applied additionally. Aucamp & Ryke (1965) recorded highly significant, better extractions, by the grease film method.

PLOT A

A total of 182 Oribatei, representing 7.951% and 2.895% of the total mesofaunal numbers and biomass values respectively, were recovered by funnel method, in comparison with the 65 mites extracted by means of the grease film method.

PLOT B

A total of 189 Oribatei were extracted by funnel and 250 by means of the grease film method. The funnel apparatus was only capable of extracting 9.911% and 9.636% of the total me-

sofaunal numbers and biomass respectively in comparison with the 13.109% and 13.639% recovered by residual extraction.

PLOT C

In this plot the funnel apparatus made a better extraction, recording 124 out of 157 oribatid mites, which represented 11.081% and 6.847% of the total mesofaunal numbers and biomass values.

PLOT D

In the sandy soils of Section 2, the funnel extractors were not so successful with oribatid extraction. The residual extraction recorded 187 mites which was equal to 10.470% and 7.708% of the total mesofaunal numbers and biomass respectively, in comparison with the initial funnel extraction, which produced only 25 specimens or 1.400% and 1.024% of the total mesofaunal numbers and biomass respectively.

PLOT E

Just as in the previous plot, higher numbers were recorded with the grease film apparatus. A 128 oribatid mites were recorded against 31 from the funnels. The first number was equal to 5.051% and 2.458% of the total mesofaunal numbers and biomass respectively.

ACARIDIAE

The Acaridiae was represented by only 42 specimens of Tyrophagus sp. With the exception of one, all were extracted by the funnel apparatus.

"OTHER ARTHROPODA"

Plot A was the only plot which recorded higher numbers and biomass values for funnel extraction in this section. All the citrus plots had higher totals from the grease film method. The explanation is quite obvious. All the citrus plots had considerably higher numbers of Collembola, while only a few specimens were recorded at the control plot. Furthermore, most specimens of this dominant order were extracted by the grease film method. On the other hand, the "Other Arthropoda"-section of the control plot consisted of a variety of arthropods of which Spirostreptidae and Liposcellidae were the biggest contributors. These two families were almost exclusively extracted by the funnel method.

PLOT A

By the funnel extraction method, 279 arthropods other than Acari were extracted. They represented 12.189% and 61.101% of the total mesofaunal numbers and biomass respectively. The 195 "residual" arthropods contributed 4.150% and 28.179% of the total mesofaunal numbers and biomass respectively.

PLOT B

Whereas only 94 "other arthropods" were extracted by the funnels, 232 specimens emerged by the grease film method. This figure was equal to 12,167% and 29.703% of the total mesofaunal numbers and biomass respectively, in comparison with the 4.929% and 29.514% from the funnels. The main grease film contributors were the species Isotomina termophila (Axelson) and Onychiurus camerunensis (Schött) , which together contributed 226 specimens out of the total of 232.

PLOT C

The greatest variety of arthropods other than Acari were extracted by funnel method, but the grease film residual recoverings of the two mentioned species of Collembola completely dominated this section. From the total of 583 "other arthropods" recovered by the grease film apparatus, 569 were contributions made by the species Isotomina termophila (Axelson) and Onychiurus camerunensis (Schött). Thus the grease film section represented 52.100% and 67.085% of the total mesofaunal numbers and biomass values respectively in comparison with the 5.362% and 20.982% for the funnel section.

PLOT D

With the exception of a few specimens from other families, the Collembola were responsible for the numbers in this "Other Arthropoda" section. The largest population of these insects was recovered by "residual" extraction.

The 392 "other arthropods" extracted by the funnel apparatus represented 21.948% and 34.369% of the total mesofaunal numbers and biomass respectively. The grease film apparatus, however, extracted 580 "other arthropods" which was equal to 32.475% and 52.574% of the total mesofaunal numbers and biomass respectively.

PLOT E

Out of a total of 2,043 "other arthropods" recorded for this plot, 1777 specimens were recovered by grease film method, and of this figure, only 7 were not collembolans. The grease film part of this faunal group represented 70.126% and 81.567% of the total mesofaunal numbers and biomass respectively. The 266 individuals recorded by the funnel method represented 10.497% and 14.092% of the total mesofaunal numbers and biomass values.

During an experiment executed by Aucamp & Ryke (1965), no significant difference was found in the extraction effectivity of the two methods employed in relation to Collembola. In this investigation, however, the grease film method proved to be hihgly successfull for collembolan extraction, thus far better than the funnel method.

CONCLUSIONS

The funnel method proved itself an excellent Trombidiformes extractor. After subjection to funnel extraction, only 83, or

2.187% of all the trombidiform mites collected were recovered by residual extraction. The funnel apparatus produced 3,712 trombidiform mites which was equal to 97.813% of the entire Trombidiformes collection.

After funnel application, 74, or 32.743% of all the Mesostigmata collected, were collected by residual extraction, which reveals that the initial funnel extraction method was less successful with this order. A total number of 152, or 67.257% of all the Mesostigmata collected was extracted by the funnel apparatus.

For the Oribatei, 551 specimens or 45.387% of all the oribatid mites collected, were recovered by the funnel apparatus. In comparison, 663 specimens or 54.612% of the total Oribatei collection were afterwards collected by residual extraction. It is therefore obvious that more than half of the Oribatei collection would have been lost, if no residual extraction was applied.

In connection with the dominant insect order, Collembola, only 757 specimens or 19.287% of all the collembolans collected were extracted by the funnel method. A total of 3,168 specimens or 80.713% of all the Collembola collected in this investigation, were recovered afterwards by residual extraction.

The extraction results obtained by the present investigation reveal that the funnel method was inefficient for quantitative Oribatei and Collembola estimations, but was nevertheless very good for Trombidiformes extractions, and moderate-

ly successful for Mesostigmata. For future quantitative - ecological work, it is suggested that the grease film apparatus should be applied as a residual extractor, after the soil cores have been subjected to funnel extraction.