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Insects of the University of Nottingham Lights

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Introduction

The University of Nottingham is situated in a large campus of 120 hectares that has been awarded Green Flag status for the past 14 years. The underlying rock is Nottingham Castle sandstone, laid down in the Triassic period 250mya, and contributes to a well draining and reasonable fertile soil. The undulating landscape is managed to produce a number of garden types including formal and informal gardens, orchards and arboretum, acidic grassland and a number of water features. The lake (managed by Nottingham City Council within Highfields Park) with its associated woodland and Tottle brook are congruous with the campus. With such a diverse range of habitats that, in certain areas, are managed with the goal of increasing biodiversity, it is slightly strange that there is no formal initiative in assessing the biodiversity of the campus.

One opportunity presented itself after a chance encounter with an electrician who was tasked to clean the lights within the school of life sciences (formerly school of biology) building. Positive phototaxis is a common phenomenon among certain insects¹ so, at least in this small subset some qualitative and quantitative data could be obtained. All the academic papers found deal with light trapping in external environments e.g.^{2,3}.

What sort of insects could be found within a typical building of the university of Nottingham? And what quantity?

Thanks to the diligent collection by one of the electricians (Glyn Lloyd, below right) samples were obtained from seven buildings located, in the main, from the South East side of the campus.

Variable quantities were obtained from different sites, but nearly 0.25m³ from the library where the lights had not been cleaned for at least 10 years!

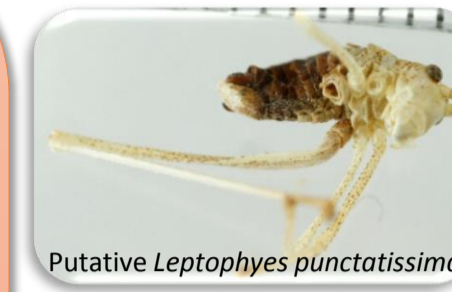
Limitations of the classification were due to:

- [1] The smaller insects, largely tiny diptera, were too small, too intertwined and too damaged to differentiate.
- [2] Many specimens were bleached so it was decided to group them according to order and not to try and identify species (this was occasionally possible and listed below).

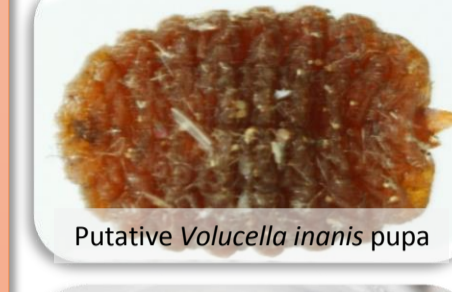
Identified species: Perhaps the strangest animal in the lights was a single juvenile Moorish gecko, a descendant of those accidentally released in the building in the 1970s. The ladybirds were generally 7 spot or the invasive harlequin. The wasps were common wasps and the large flies consisted of various hoverflies, houseflies and blue bottles. The very small insects were generally various diptera. The library included a large number of May bugs, and an assassin bug. Of the Lepidoptera: poplar hawk moth, Dark Arches, Large yellow underwing, Silver Y, Light arches, Lime Hawk, Heart and Dart were found. Also Peacock and Small tortoiseshell butterflies. There were also Hawthorn and Pine shield bugs, other small hemiptera and a very damaged cricket (possibly a speckled bush cricket). There was also, on occasion, a number of dermestid larvae eating the dead insects.



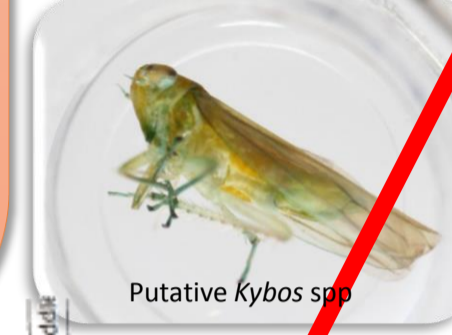
Moorish Gecko *Tarentola mauritanica*



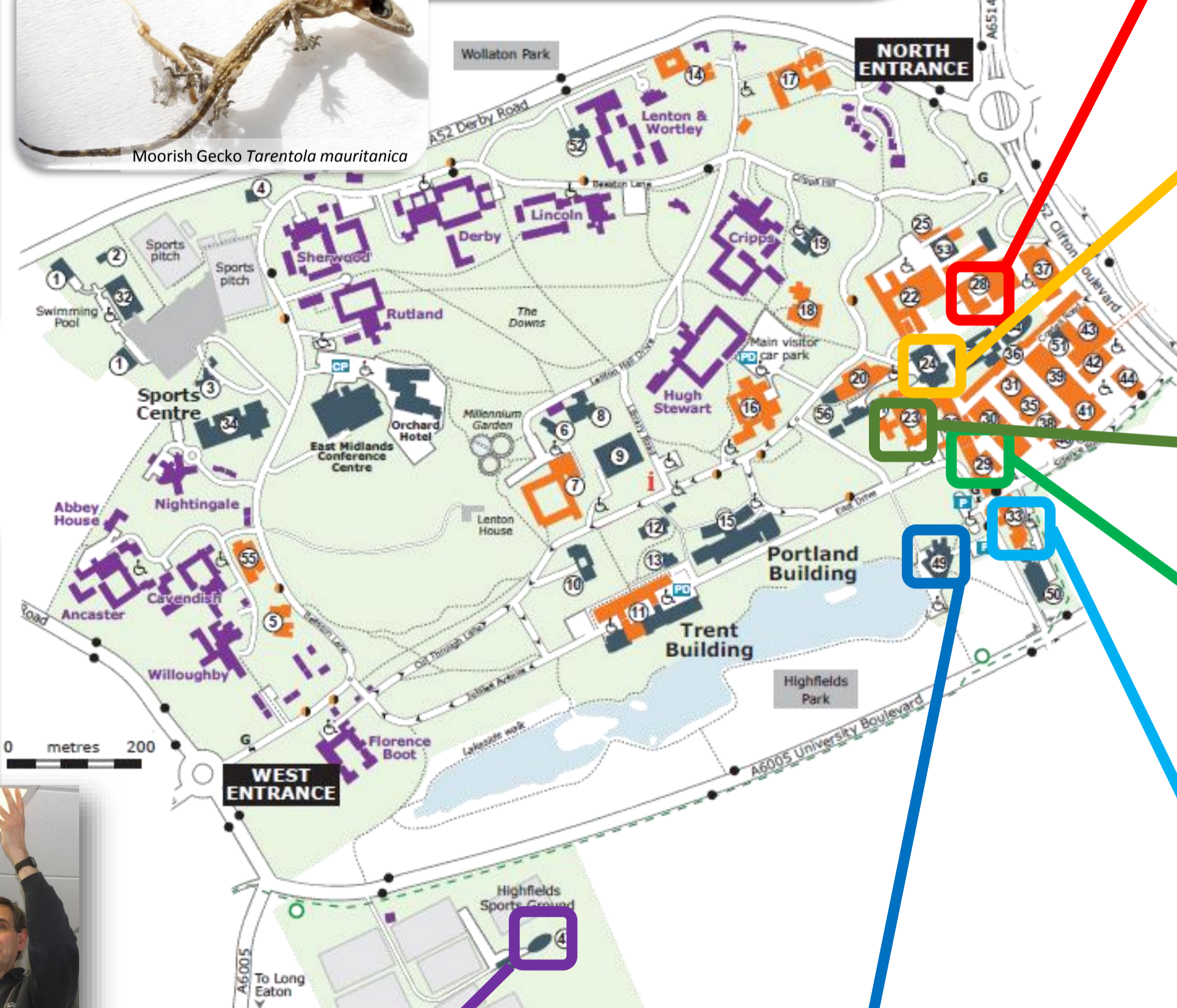
Putative *Leptophyes punctatissima*



Putative *Volucella inanis* pupa

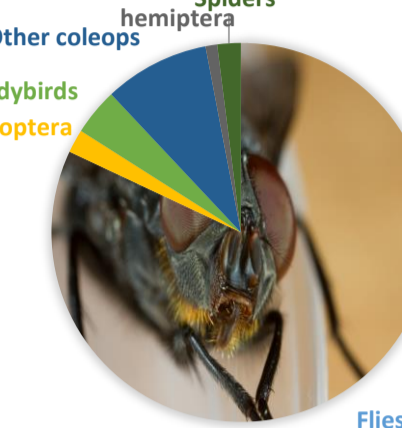


Putative *Kybos* sp.



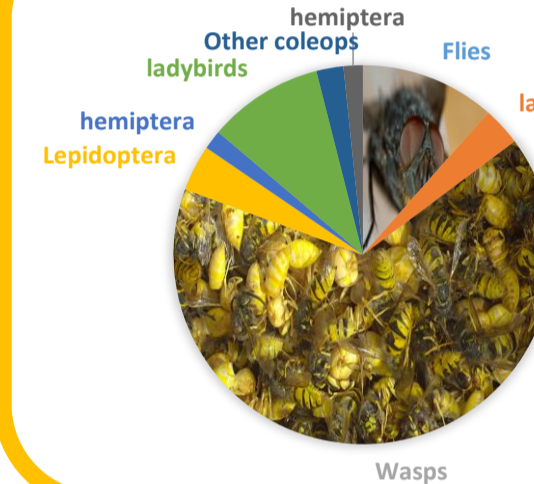
Pie charts of arthropod percentages by building.

CHEMISTRY



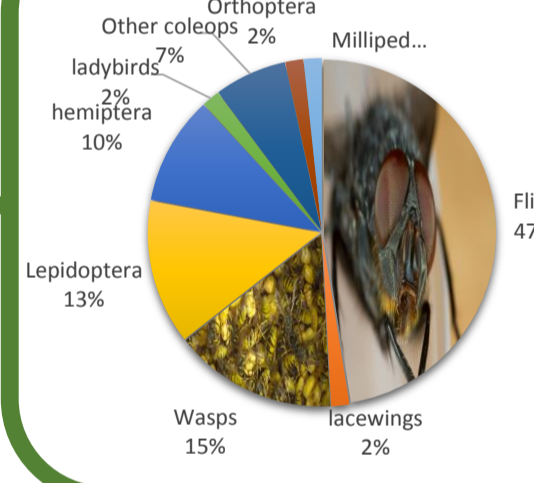
The school of chemistry, located furthest away from any significant water features nevertheless had a disproportionate quantity of houseflies. These insects may well be attracted by the volatile compounds used in the organic laboratories. (n=100)

GEORGE GREEN LIBRARY



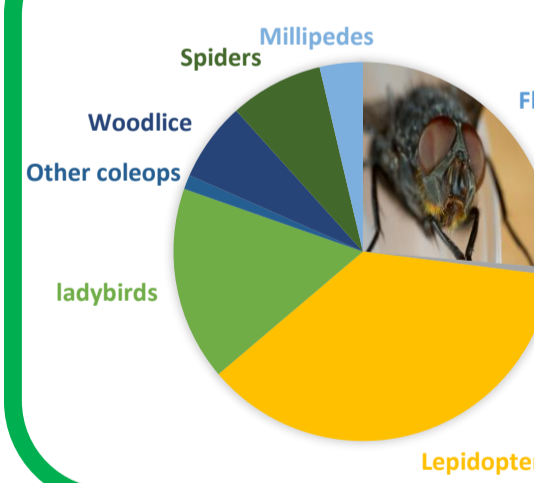
The lights from 3 floors of the library yielded an enormous quantity of material. The most obvious were the may bugs, but as expected, the main catch were the wasps, flies and ladybirds. (n=304)

LIFE SCIENCES



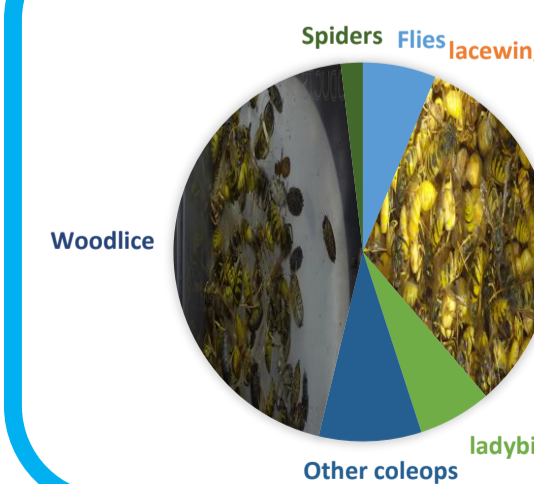
The Life sciences building has been sampled a number of times. The wasp representations varies, presumably due to the proximity of the nests. This may also explain why a large pupa was found possibly of the hoverfly *Volucella inanis*. (n=153)

PSYCHOLOGY



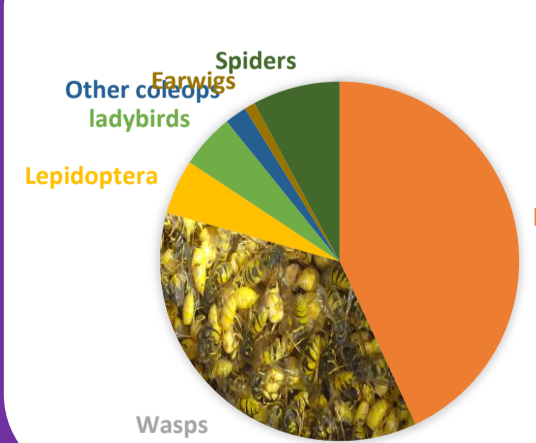
The school of psychology building, had a greater representation of lepidoptera and other arthropods than any of the other buildings. The location is closer to a number of trees than many of the other locations. (n=163)

MUSIC SCHOOL



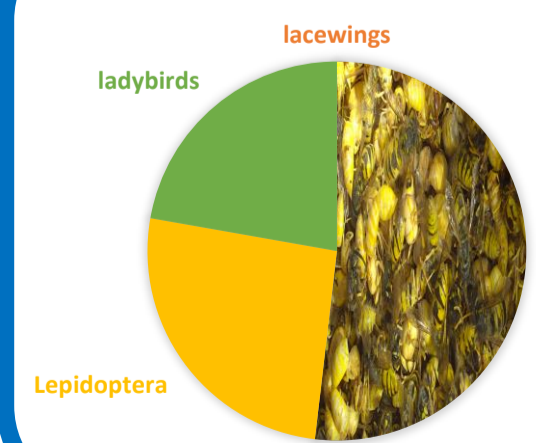
The Music school had an interesting fauna that consisted of large numbers of woodlice indicating a much damper environment than other buildings. It is not clear how they infiltrated the light fittings. (n=160)

VAUGHN PARRY WILLIAM'S BUILDING



The Vaughn Parry Willman's building is the only one on a separate part of the campus. The area is surrounded by undeveloped land and perhaps this is more attractive to the large number of lacewings caught in this building. (n=104)

DH LAWRENCE BUILDING



The DH Lawrence building is the local Arts centre and is situated on the banks of the lake. With a large cafeteria inside and multiple entrances and evening opening it is, perhaps, unsurprising which species are most commonly caught. (n=135)



Nottingham Advantage Award students counting arthropods at a lunch session.

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Conclusions and discussion.

The serendipitous acquisition of insects from the lights of different buildings on the campus raises a number of interesting points. First is that there is a huge insect (and other arthropod) fauna on campus and a significant number find themselves within the buildings and are then trapped in the light fittings. Second, the number of arthropods with positive phototaxis such as moths, ladybirds and wasps is countered with the arthropods that, it would be assumed, shy away from light such as the spiders, millipedes and woodlice. In these cases, perhaps the lights are capturing these animals during the night as pit-fall traps and which are then desiccated during the day. A number of unusual specimens were also collected and there are also indications that some of the lights are forming a small ecology of their own as the corpses of the insects are consumed by museum beetles and their ilk.

References:

1. van Grunsven, R. H. A., *M. Donners, M., Boeke, K., Tichelaar, I., van Geffen, K. G., Groenendijk, D., Berendse, F., Veenendaal, E. M. (2014) Spectral composition of light sources and insect phototaxis, with an evaluation of existing spectral response models Journal of Insect Conservation 18(2) DOI: 10.1007/s10841-014-9633-9
2. Epsky, N. D., Morrill, W. L., Mankin R. W. (2008). "Traps for Capturing Insects". In Capinera, J. L. (Ed.). Encyclopedia of Entomology. Dordrecht: Springer, pp. 3887-3901.
3. Robinson, H. S. (1952). "On the behaviour of night-flying insects in the neighbourhood of a bright source of light.". Proceedings of the Royal Entomological Society of London. Series A, General Entomology. 27 (1-3): 13-21

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