APSEC

Insect-Testing Services

About Us

APSEC (APS Entomological Consultancy) are experts in the development and evaluation of insect pest-control products and services. Within the company there are over 30 years of research and practical experience of the management of nuisance insects, including mosquitoes, biting and non-biting midges, ticks, and other biting insects.

The founder of APSEC is Dr Alison Blackwell, who is at the forefront of biting insect research and is frequently called upon as an international expert in this area. Additionally, we have other experts within the team that have been heavily involved in biting insect research at various leading institutions across the UK.

STANDARDISED

We work to WHO & EPA guidelines with robust protocols to ensure we meet the standards required.

CLIENT FOCUSED

We will work with you to provide the best service possible and tailor our services to your needs.

EXPERT KNOWLEDGE

With over 30 years' experience in insect control, we guarantee excellent service.

Contact us using the details below to discuss your insect testing requirements.

apsec@apsbiocontrol.com

+44 1382 561 696

Prospect Business Centre,
Gemini Crescent, Dundee
Technology Park,
Dundee, DD2 1TY

www.apsbiocontrol.com

Our Insect Testing Services

Our protocols are adapted from two established standards (US EPA and WHO guidelines) and follow the guidelines set out in the European Chemicals Agency technical notes for guidance (ECHA TNsG) on Product Evaluation. We can aid in the evaluation and development of various products to manage nuisance and vector species of insects such as:

- **Insect Repellents**
  - We can assess topical repellents (or repellent-impregnated material) *via* arm-in-cage tests, *in-vitro* tests and field trials on midges, mosquitoes and ticks. We can also utilise an olfactometer to evaluate repellents in the presence of host odours.
  - Although not technically insects, we do offer these services on ticks as well (*Ixodida*).

- **After-Bite Treatments**
  - Similar to arm-in-cage testing, where biting is permitted, the after-bite treatment is applied and the relief provided is assessed over time.

- **Oviposition Insecticides, Larvicides and Repellents**
  - Simple assays to study the impact of insecticides on mosquito eggs, larvae and pupae, as well as repellents on oviposition behaviour.

- **Insect Attractants**
  - Attractant semiochemicals can be assessed at any scale, from laboratory olfactometers (y-tube, 4-way or free-flying) to full-scale field testing; e.g. when incorporated into attractant-based traps.

- **Insect-Control Products**
  - Our flexible approach allows us to design suitable assays for your insect-control products be it a new mosquito trap, repellent, insecticide or similar.

Our Testing Facilities

Laboratory Based

At APS we currently have an environmentally controlled lab, in which we culture 3 different species of mosquito:

- *Stegomyia (Aedes) aegypti*
- *Culex quinquefasciatus*
- *Anopheles gambiae (malaria-transmitting mosquito)*
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We are able to obtain other mosquito species upon request.

We also have *Culicoides* biting midges available and can collect field-populations of ticks for lab assays.

Field Sites

We have excellent access to field sites throughout the UK and also have access to European sites and those further afield on request.

APS is ideally located in Scotland to offer these services on *Culicoides* biting midges, having access to laboratory-reared insects all-year-round and field populations, May to September.

Our Services in Detail

Arm-in-cage Test

The arm-in-cage test is used to assess the repellent effect of a topical repellent or treated fabric to be worn by the user.

The arm-in-cage test can inform the client of:

- Complete Protection Time (CPT) – the time between application of the repellent and the first confirmed mosquito bite.
- % Repellence – this is defined as how much extra protection a user would get from using one product compared to a blank control and an excellent assay for development work prior to having a final formulation for CPT testing. It can also be compared against another known repellent.

Field Testing

During the midge season (May – Sept), we can conduct repellent field trials on both midges and ticks. This involves applying topical repellent to volunteers in the field and comparing landing rates with control arms. We can also field test in other locations around the UK/Europe/Africa on request.

Field testing allows us to evaluate how effective a repellent is in the “real world” under the exact conditions the repellent would be used.

In-vitro Testing

This allows us to test the repellent effect of a product by using heat and Carbon Dioxide (CO_2) as an attractant as an alternative to cage testing. It can be particularly useful with insects that are reluctant to “behave” in arm-in-cage assays or where ethics dictate that human subjects should not be used. Insects are allowed to freely fly in a large assay cage and the heat source is applied with repellent, while CO_2 is also pumped in.

From this we can provide data on the number of insects landing and attempting to feed at the repellent treated source compared to a non-treated source.

After-bite Testing

Arm-in-cage tests are also used for after-bite evaluation. Here, the mosquito is permitted to bite the volunteer and after-bite is applied and the bite mark is assessed for the following 72 hours.

Via this test we can inform the client of the degree of relief that volunteers experience from irritation following the first application of test after-bite solution. This can range from complete, elongated, partial and low relief.

Olfactometers

Olfactometers can be used to assess insect behaviour in the presence of various attractants or repellents. Typically, we use a free-flying olfactometer to evaluate the responses of mosquitoes to repellents when a host is present, which is an excellent approach to incorporate into a repellent-development programme. For smaller insects, particularly non-flying ones, we have smaller olfactometers (2-way and 4-way) that can be used to assess behaviour responses to semiochemicals.