Heath-Robinson entomology

Cheap home-made alternatives for the citizen scientist

Traditional equipment	Alternatives
Collecting	
Commercially available tough reinforced **sweepnet**	Home-made net using broom handle, metal tubing and cotton
Commercially available **'insect' net**, folding frame is neat and easy	Home-made net using coat-hanger wire, webbing and net curtain
Folding **beating tray,** cotton fabric stretched on wooden or bamboo folding fan frame	Pale-coloured umbrella, or just spread a white sheet out on the ground under the tree
Glass collecting **tubes**, variety of sizes, 'bottle' style with reinforced rim/neck my favourites, glass-topped 'pill boxes', tins for larvae,	Small glass/plastic containers: herb/spice bottles, mint packets, medicine bottles, micro Tupperware, humus/dip containers, cream-cheese packets, gift boxes, sweet tins, take-away packets, the list goes on.
'Pooter' suction collector, several styles available commercially	Make your own using small bottle and rubber or plastic tubing used in home-brew set-ups
Sieve for sifting grass cuttings, straw debris, flood refuse etc	Standard garden sieve, stacking sieve nests also useful
Mercury vapour moth-traps available in many different designs and configurations. Mains- and battery-powered, with or without generator.	Mercury vapour light run on its own on a white ground sheet. Any powerful bulb works to some extent. Lighted windows, porches and street lamps worth checking.
Plastic **sheeting**, for sieving, sorting or beating, and for picnic ground sheet.	Plastic sheeting easily available.
Killing	
Ethyl acetate 'killing fluid', commercially available from naturalists' suppliers, some chemists or chemical companies	Acetone-free' nail varnish remover is mostly ethyl acetate, check ingredients list. Tippex thinner (trichlorethane) no longer available.
Drop insects into storage **ethanol**	Various alchol preparations easily available from chemists — see 'storage' below.
	Leave insects in tubes overnight in freezer, insects need to be defrosted before mounting.
	Chopped cherry laurel leaves, Prunus laurocerasus release cyanide
	Very small beetles dropped into boiling water. Wetting can damage other insects.
Mounting and labelling	
Bristol **board** (4-sheet) 'traditional' card for mounting small insects	250 g/m2 (gsm) white card from art suppliers is perfectly good
	Try cutting up old Christmas and birthday cards, but use the mat not the shiny surface
Gum tragacanth preparations, smooth and tacky	Wall-paper paste made fairly stiff, PVA at a pinch for beetles with convex undersides
Stainless steel **micro pins,** variety of thicknesses (0.1–0.45 mm) and lengths (10–35mm), for direct pinning of insects	You really need to use these. Ordinary pins are much too thick and will eventually corode over the years
Entomological mounting **pins,** for pinning through the card or mounting strip holding the insect. Variety of sizes available.	Fine dress-making pins at a pinch, but these seem thick and ungainly next to the real thing

Polyporus **mounting stips**, for holding a micro-pinned insect and acting as a buffer against vibration. Plastazote strips now.	Plastazote (expanded polythene) packing can be finely cut, although this is an inexpensive item to buy.
Watch-makers and other **tweezers/ forceps**, for picking up insects and holding the pins used for pinning and mounting	Eye-brow plucking tweezers come in a variety of shapes and sizes. Fine tweezers available from modelling shops.
Cork **setting boards** for pinning insect wings out, especially for butterflies and moths	Most insects can be roughly pinned, using small pieces of plastazote and tracing paper.
Setting needle, for teasing out legs and wings during gluing and carding, or on setting boards	Micro pin stuck into matchstick. Old books recommend a thin stiff animal bristle
Ready-printed data labels using permanent ink on acid-free board	Computer-generated data labels using ink-jet or laser printers.
Mapping pen for hand-writing or annotation of inidividual data labels	Narrow-tipped pens easily available from high-street stationers
Storage	
Custom-made insect cabinets with air-tight fitted glass lids on cork-lined drawers.	Available second-hand, but can still be expensive or in need of renovation.
Wooden store-boxes, cork- or plastazote-lined in various sizes.	Available second hand, although new ones are not too prohibitively expensive. Smaller containers can be crafted from wood, cardboard or plastic boxes by lining with plastazote. Anything less than perfect air-tight boxes needs to be checked regularly for pests like museum beetles otherwise entire contents can be lost.
Storage ethanol, especially for soft-bodied creatures like spiders and larvae.	Absolute (95-100%) alcohol needs license from HMCustoms, but alternatives like rubbing alcohol work, as does concentrated white pickling vinegar. Sepecimens need to be soaked in water to clean them before mounting. Can make specimens brittle.
Identification	
Monographs, identification guides and technical articles scattered in specialized entomological journals.	Accurate identification still requires some of these, but there is increasingly a cross-over between 'popular' and 'scientific' guides.
Comparison of specimens with those in the named collections in museums and learned institutions	Still a useful technique, but you have to know where to go and who to see. You also need to be some way along to identification. Local museums often have UK insect collections and are keen to foster links with local residents.
Hand lens, x 10 multiplication is standard for field use, x 20 in bright light	Still the easiest and cheapest item of specialist equipment to buy
Stereo (binocular) microscope, magnification range x10 to x 30 (up to x 100 rarely), either zoom optics or rotating object lens set, with good lighting. Cost: anything up to price of small car.	Basic binocular microscope can be bought new for £65 (x10) or £120 (x10 and x30). A cheap anglepoise lamp provides ample light.