DOWNLOAD PDF PREPARATION AND CURATION OF INSECTS

Chapter 1 : Conservation and restoration of insect specimens - Wikipedia

Book: Preparation and curation of insects. blog.quintoapp.com 2 pppp. ref ref Abstract: This revised 2nd edition of this handbook contains details of the methods and techniques used for preparing insects for the New Zealand Arthropod Collection and for curating and managing this collection.

Have students work in groups of 2 to 4. Only adult insects that have a robust thorax are pinned. This is because only these have enough thorax exoskeleton and muscle to support the weight of the insect on the pin. In fact, the inside of the insect exoskeleton has many rod-like and ridge-like struts and invaginations where muscles attach. Insects with complete metamorphosis have immature stages that are easily identified as such and are soft bodied e. However, immatures of orders with incomplete metamorphisis look like miniature adults so require a bit more care. These immature insects do not have fully developed wings. Instead they have "wing buds" of increasing length e. If in doubt about whether an insect is adult or not, it is safest to preserve it in ethanol it can always be pinned later. Locomotion requires muscles and hard exoskeleton for support, both present in the thorax and required for pinning an insect. Demonstrate the process of correctly pinning insects on the board. Only adult insects are pinned. All soft-bodied adult insects, immature insects and non-insect arthropods are preserved in ethanol. Adult insects are pinned through the thorax in the 2nd and 3rd thoracic segments where wings and rear 2 legs attach. Pinning is always done the same way with pin perpendicular in lateral and head-on views, and placed right of the midline show a diagram, or draw on board. Take pin in other hand and locate 2nd and 3rd thoracic segments look at sides of insect as well as dorsum. Insert pin into dorsum of 2nd or 3rd thoracic segments penetrating the exoskeleton but not too deep. Line up the pin as you push the pin deeper into the insect. Feel for the ventral exoskeleton and line up the pin in side view and head on view and when perpendicular in both views, push the pin through until the pinhead is a "good gripping distance" from the insect dorsum. A "good gripping distance" is one that allows people to grip the insect pinhead without touching the insect, keep in mind others may have much larger fingers than your own. Obtaining the correct height on the pin can also be done with a pinning block. Once the insect pin is completely through, forceps may be helpful in adjusting height on the pin. Fold the card rectangle along its long axis making a "v", then take the insect on the pin and pin into the card bringing it up under the insect so that the "v" cradles the insect legs and abdomen see diagram. Then with another insect pin gently move the legs and antennae back, and abdomen to the center to make a nice presentation. Now the specimen should have a label placed under the card "v" and set on the foam to dry. After several days to a week air drying, the card should be removed and the label replaced and the insect is ready for further study. Fluid preserved specimens can be placed, using soft-touch forceps, into a vial with ethanol and data label. Students can sort similar looking specimens into separate vials if time and materials allow. Hand out specimens with labels, pins, foam, and card supports. Tell students to pin as many of their insects as time allows. Walk around to students to help them individually. Clean-up minutes Place all insect specimens in a dry and warm area so they can dry out oven or in warm part of room. It is best if specimens are not in the sun, but even this is okay if just for a few days.

Chapter 2 : What We Learned From Our Insect Curation Internship | OSU Bio Museum

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Bug signs Insect collecting in New Zealand and the South Pacific Insect collecting is an enjoyable and rewarding hobby. The diversity of insects, their life cycles and behaviour all make for fascinating study. Their size, however, makes specimens essential for confirming their identification. There are a number of resources available for the interested public, foremost among them being the excellent The preparation and curation of insects by Crosby and Walker. Connect with the Society on Facebook to meet up with other entomologists. The collection of insects for scientific purposes is necessary for answering critical questions regarding insect diversity, evolution and biology. This page seeks to answer questions regarding the process of negotiating insect collecting permits in New Zealand and nearby Pacific Islands. Much of the material on this page was gathered by Milen Marinov, and collated by Samuel Brown. This information is offered as a guide only, and we accept no responsibility for any inconveniences or losses suffered as a result of following it. For collecting on Public conservation land, permits must be sought from the Department of Conservation. Bringing insects into New Zealand New Zealand has a strict biosecurity programme, administered by the Ministry of Primary Industries , that seeks to prevent unwanted organisms from establishing in the country. All animal products including insect specimens and equipment used for collected insects nets, traps, tramping boots etc , must be declared upon arrival in New Zealand. Declaration does not incur a fee, and in most cases will only cause a minor delay on your entering the country. Equipment will be checked for live insects and seeds etc, and specimens will be checked to ensure that they are dead. Specimens can be dry preserved by being pinned, or in paper envelopes; or wet preserved in alcohol, propylene glycol or hand sanitizer. Make it clear that specimens are for scientific study. For more information, please consult the MPI webpage on Importing preserved animal specimens from all countries , or contact MPI directly. Importation of live insects is much more problematic, and should only be done after obtaining the correct permits from MPI, and after consultation with colleagues in New Zealand. Applications are requested three months before the intended visit, however applications usually only take around two weeks to be processed. For research intended to be conducted out in our outer islands, research proposals must first obtain approval from the island Mayor. Intending researchers should also visit the Cook Islands Immigration website www.

Chapter 3 : Paul Brown | Natural History Museum

General procedure for pointing and double mounting (1) (2) (3) Place several specimens on the edge of a raised surface with their heads facing left (Fig. 9), or right if the pin is.

Collection[edit] Insect collecting can be done in many different ways depending on the kind of insects being collected and from which habitats. Both hobbyists and professional entomologist have found particular ways to collect with minimal damage to their specimens. Following established techniques helps begin the conservation of insect specimens from the beginning by eliminating as much potential damage as possible. It must be done delicately to ensure that neither the collector nor the live insect itself will cause harm to the distinctive features such as wings, legs and antennae that give purpose to the collection. Special collection nets, traps and techniques must be utilized in consideration of how easily breakage can happen. A kill jar is often used to immediately immobilize the insect before it can damage itself. Preparation[edit] The way an insect specimen is prepared is often the first step in their conservation. They have to be carefully prepared with the appropriate methods depending on their size, anatomy, and potentially delicate features to ensure they will not break before they begin their role as a specimen available for study, research and display. Some specimens must be prepared using a dry method and others with liquid to preserve. Pinning[edit] The process of pinning insect specimens is a dry method to preserve and display collections and requires special entomological equipment to accomplish effectively. It is used primarily for hard-bodied, medium to large specimens and is beneficial for easier study and color preservation. Insects are pinned on foam block or specialized pinning blocks that provide support for the limbs while drying and may be moved to another specialized, protected display case after they have dried completely, at which point they will be more brittle. The pin is most often driven through the thorax of the insect just to the right of the mid-line to preserve the appearance of at least one side should any damage occur from pinning. The exception is butterflies, dragonflies and damselflies, which are pinned through the middle of the thorax. A pin is then driven through the broad side of the point for mounting. A soluble glue that can be removed with solvents when necessary is used to adhere the right side of the thorax of the specimen to the point opposite the pinned side. The point is sometimes bent to allow the specimen to present in the same position as normally pinned specimens. Specimens that would receive this preservation technique are usually soft-bodied, such as caterpillars, larva, and spiders because of their soft abdomens. This is done to minimize shriveling allowing the identifying characteristics to be preserved as true to life as possible. Hard-bodied insects may also be preserved temporarily in alcohol before pinning. Each of these areas also apply to the conservation and restoration of insect specimens. Preventive conservation[edit] Insect collections may suffer multiple types of degradation including fading colors from light exposure, mold growth from improper humidity and temperature levels, and infestations from pests that feed on dried insect, [6] but much of this is avoidable when proper preventive conservation practices are followed. Routine cleaning[edit] In addition to maintaining a clean storage environment for specimens, it is sometimes necessary to clean the specimens themselves. Cleaning incredibly delicate and brittle dry insect specimens is done carefully and methodically. The conservator chooses the appropriate method based on the kind of insect that needs cleaning and how robust it is. Fluid levels are regularly monitored to ensure specimens are completely immersed in fluid, though a well-sealed jar or vial will prevent excessive evaporation. Curved forceps may be used to allow more precision and less chance of the brittle specimen coming in contact with the handler. The handler picks up the specimen by the pin, which is placed with enough space below the specimen for the handler to put in the pinning block and enough space above to grip without touching the specimen. Integrated pest management[edit] Integrated pest management IPM is a specialized modern pest control used in museums. Some pests, such as carpet beetles and flour beetles, feed on dried insects. Freezing is commonly used to rid insect collections of pests. Assessing the condition of an insect collection is done regularly and the results are recorded accordingly. The conservator observes the specimens in high detail remarking all areas of damage, or altered states of the specimen. Tools used during this process may include a strong light source, magnifying glass and handling tools that allow the conservator to pick up the specimen

from the pin without touching it. The observations made during the examination process result in the conclusions drawn for a treatment plan if necessary. Common agents of deterioration[edit] Pests - Evidence of pests are recognized in castings of insects, their droppings or the damages they have caused from chewing on specimens. Mold - Mold is most likely to grow when humidity is high. Verdigris - A blue-green hair-like crystallization caused by reaction to copper and brass entomological pins and the fats from the insects internal organs. Documented information begins with the capture of an insect. The collector records information about capture method, place and date of capture and any relevant habitat information in field notes. This information is then transferred to labels and collection records. The documentation path then continues with every recorded observation or treatment the specimen receives. Killing agents, preservation agents, rehydrating agents, and fumigants are all important to record. Labeling[edit] As a minimum, labels contain the place and date of collection, and the identification of genus and species. On pinned insects, the labels are likewise pinned with the space left under the specimen on the same pin. Large databases can hold vast amounts of information improving research efforts. Pen and ink scientific illustration of a dragonfly. Illustrating[edit] Scientific illustration of insects is an older technique used to preserve information about collected insects. Scientifically informed observation of specimens combined with technical and aesthetic skill yields the highly detailed illustrations necessary for the documentation of each species that is illustrated. The conservator records all of the visual information about the specimen that can be gleaned from detailed inspection. Conclusions are drawn from inspection and potential treatments are also documented to inform researchers and future conservators. Researching ticks helps develop health guidelines against the diseases they spread. Research[edit] Researching the collections of insects provides important information that develops knowledge about ecology, human health and crops. Research of the insect collections in museums can lead to new discoveries of species, [23] and provide an important historical resource. It is highly preferable that any treatment applied be reversible or done with little risk to the specimen. For example, broken limbs may be glued back on, which has traditionally been done with white glue. The advantage to white glue being that it is removable in warm water. When dried insect collections have suffered an infestation, the affected specimens can be frozen or sealed with inert gases to kill the pests without harming the specimens. In the case that a specimen needs to be repositioned, the conservator will "relax" the specimen in a jar with a rehydrating substrate to move the limbs without breaking them. The technique used will vary among conservators. Some use a relaxing jar that the specimen is left in for days with the substrate of choice, others may choose to use a warm water bath with a drop of detergent. Whatever treatments are used are diligently documented. Education[edit] Conservation of insect specimens is done in large part to preserve the information for the public. The display of collections in museums and their interpretation offer one avenue that accomplishes this effort. However, websites offer a unique opportunity to disseminate information to a broad audience with layers of information to give general information or to provide depth where desired. These websites are often also provided by museums and their collections. Below is a list of some major educational endeavors with interests in insect specimens. Large-scale insect specimen digital preservation efforts[edit].

Chapter 4 : Insect collecting in New Zealand and the South Pacific - Entomological Society of New Zealand

DESCRIPTION: Interns will assist in the curation and collections management of a broad spectrum of insect specimens from locations worldwide. Interns will receive training in sorting raw samples, identification of insects to at least family level, specimen preparation and labeling, databasing information, and/or capturing data from the specimens in the collection.

To provide identification and biological information for parasitoids of mountain pine beetle MPB: Dendroctonus ponderosae in Wyoming, and contribute to the standardization of sampling methods for the study of bark beetle parasitoids. Project Methods Museum RecordsMuseum collections preserve valuable information from the past that can be compared to more recent data to analyze effects of climate on interactions between bark beetles and their parasitoids. Useful information from this source may include location, presence, seasonality, and, of course, specimens that can be compared to more recent collections. For example, we were able to confirm the presence of several natural enemies of bark beetles in the Greater Yellowstone Ecosystem for our study through these collections. Museum data will be recorded in a database, along with data from our current study. We recognize that the data from local collections is limited, so we hope to be able to expand our review of museum collections in future studies. It will be important to gather data from other Rocky Mountain regional collections that hold material from Wyoming, especially the other regional USDA Forestry Service research stations and their affiliated universities. We are building a voucher collection of MPB and associates that will be available to scientists for future study e. This collection consists mostly of dried-and-mounted specimens for morphological studies, but because such specimens do not preserve DNA, we will also keep specimens refrigerated in alcohol. All specimens are labeled with customary collection data name of collector, along with how, where, and when collected. We will be using student technicians for the bulk of this work. Proper specimen preparation and curation are essential, so all student technicians will receive thorough training in these techniques and will be adequately supervised. Study SitesShaw and Haimowitz have been gathering data since from limber pines on the east side of the Old Lincoln Highway in the Pole Mountain Unit of the Medicine Bow National Forest, Wyoming, and we will continue to work at that site for the duration of this project. However, since MPB activity at this site is spotty and only in limber pine, we will need two more sites with MPB activity in other host species, and with more intensive MPB activity for our tests of sampling-methodology of parasitoid emergence. Suitable sites will be chosen in high MPB-activity areas by scouting in late spring Flight intercept traps, including Malaise traps, will be employed to detect and characterize MPB parasitoid assemblages in our study. Flight intercept traps are structures that have a transparent barrier that flying insects bump into, while additional barriers direct the insects into a collecting head. Samples will be collected weekly over a 12 to 14 week period. For initial studies on Pole Mountain, Malaise traps were chosen because many previous studies have demonstrated the utility of this kind of trap for general surveys of parasitoids in forested areas Lewis and Whitfield ; Mazon and Bordera ; Noyes ; Shaw In , Shaw and Haimowitz sampled from July through September, with one trap adjacent to limber pine having active MPB attacks, and the other adjacent to old MPB-killed trees needle-fall nearly complete with no active attacks. Parasitoids of wood-boring insects were sorted from the catch and curated for study. Known MPB parasitoids were separated, and the rest of the catch of wood-borer parasitoids was compared between the traps to screen for suspected MPB parasitoids. Parasitoids found only in the trap adjacent to MPB activity, or those in much higher numbers in that trap are likely associated with MPB activity in some way. Shaw and Haimowitz are continuing trapping through the summer of in the same location. Surveys will also be conducted at other sites with different host trees and levels of MPB activity. Most bark beetle parasitoids are known to be generalists, with each species known to attack several to many species of bark beetles Krombein and Hurd , and it is difficult to determine a complete range of host relationships for any cryptic those in hidden places, including under bark parasitoid. Through our screening study described above, we have already identified over a dozen species of parasitoids that we believe are related to MPB activity. In our proposed study, we will use proven methods to establish host relationships with MPB to further

characterize the MPB parasitoid community in our state. Not all these methods work for all bark beetles, but there are a variety of methods and at least one works for all beetles where this has been tried. Brief descriptions of representative methods follow: Bark samples are taken from infested trees following procedure of Carlson and Cole and parasitized larvae of the bark beetles are collected from the sample and reared in gelatin capsules Berisford, Kulman and Pienkowski , or reared directly from the bark samples. A patch of bark is stripped from a healthy tree, including phloem the layer that a bark beetle feeds upon , and sandwiched between plexiglass and a piece of wood to keep it from desiccating. The plexiglass is on the phloem side the underside of the bark , so that the activity of insects in the sandwich can be observed. Bark beetles and parasitoids can be introduced through holes in the wood at appropriate times to observe parasitism. A third method is to rear bark beetles in a section cut from the trunk of a freshly felled tree and placed in a container or cage. Bark beetles placed in the container will attack the piece of wood and lay eggs under the bark, which will develop into larvae. Parasitoids are then introduced to test if they attack the larvae Amman Entomologists, forestry professionals, ecologists, forestry researchers, general public. The focus of emergence trapping was expanded from parasitoids to all insect associates of mountain pine beetle. We added development of selective exclusion methods, because selective exclusion experiments have not yet been done with mountain pine beetle. We replaced our database with simple spreadsheets for recording data. What opportunities for training and professional development has the project provided? Sampling methods for bark beetles and associated insects. Specimen preparation and curation. Critical point drying and chemical drying of specimens. Identification and assessment of beetle attacked trees. Development of emergence traps for standing trees. Adoption of a method to conduct selective exclusion experiments in standing trees. Operation of a tabletop Scanning Electron Microscope. Identification of bark beetles and associated insects. How have the results been disseminated to communities of interest? Results to date have been discussed verbally and electronically with colleagues. Experience with our new methods has been presented at the International Congress of Entomology in , and at the Western Forest Insect Work Conference, the Entomological Society of America Annual Conference, and in a public presentation at the University of Wyoming in An article submitted to the College of Agriculture and Natural Resources Reflections Magazine won the student competition for best article This research has also been featured in local newspapers around the state of Wyoming in We are planning two additionalmanuscripts from this research, to be published in the future: Selective exclusion, a better way to measure the effect of the associated insect community on mountain pine beetle survival. Lyctocoridae , a predator newly associated with the mountain pine beetle Dendroctonus ponderosae. What do you plan to do during the next reporting period to accomplish the goals? Nothing Reported Impacts What was accomplished under these goals? Sampling in limber pine stands over a week period from two locations, the Pole Mountain unit of the Medicine Bow National Forest, and the South Pass area of Shoshone National Forest, using flight intercept and emergence traps. Insects were also reared from bark and wood samples taken from mpb attacked limber pines in both areas. We completed development of a better method for collecting mpb-associated insects as they emerge from standing trees. We also completed development of the first selective exclusion method for mountain pine beetle. We initiated collaborations with several specialist taxonomists. Discovery of two predators not previously associated with mountain pine beetle in other pines, Lyctocoris okanaganus Hemiptera: Lyctocoridae and Leptophloeus undescribed species Coleoptera: Laemophloeidae , both of which were recovered in large numbers. Entomologists, forestry professionals, ecologists, forestry researchers, and general public. We could not find suitable trees for sampling parasitoid emergence, so we scaled back emergence trapping. Mountain Pine Beetle mpb activity has mostly ceased in lodgepole pine in our area. Other pine trees are not suitable for our method because the traps would need to be placed well above ground level on the trunk due to bark thickness near ground level and we do not have the resources to do this. We added development of predator exclusion methods, as predator exclusion experiments have not yet been done with mountain pine beetle, and these experiments can be carried out from ground level in limber pine, the only pine tree species currently with suitable beetle activity. Focus of study has become the mpb and associated insect community in limber pine, as there is a dearth of information about mpb and limber pine. Adoption of a method to conduct predator exclusion experiments for mpb.

Identification of bark beetles and bark beetle parasitoids. Identification parasitoid wasp families and subfamilies. Database development and troubleshooting. Methodology and experience has been shared verbally and in field trips with colleagues from UW and Colorado State University. Experience with our new methods has been presented at the International Congress of Entomology in Orlando, Florida. An article submitted to the College of Agriculture and Natural Resources Reflections Magazine won the student competition for best article. Curation of voucher specimens: Sampling end of May through early September. Database entry and troubleshooting. Rearing of bark beetles and parasitoids from experimental trees, wood, and bark samples. Completion of additional predator exclusion experiments using lessons learned from the first exclusion experiment. Data analysis and manuscript preparation for one journal article. Presentation at UW on experimental methods and results to date. Submission of presentation for Meeting of the Entomological Society of America. Impacts What was accomplished under these goals? Sampling over a week period from two locations, the Pole Mountain unit of the Medicine Bow National Forest, and the South Pass area of Shoshone National Forest, using flight intercept and emergence traps. Bark and wood samples were also taken from mpb attacked limber pines in both areas; Shortcomings in previous emergence trap designs have been overcome, and we now have a fully functional method of collecting the natural enemies of mpb as they emerge from standing trees; Our first predator exclusion experiment has been completed; Our second-generation predator exclusion experiment has been deployed, incorporating lessons learned from the completed experiment; Curation of over insect specimens; Initial data entry and troubleshooting for our specimen database. Mpb activity has mostly ceased in lodgepole pine in our area. Identification of parasitoid wasp families and subfamilies. Methodology and experience has been shared verbally and in field trips with colleagues from UW and CSU. Results to date are very limited, but have been discussed verbally and electronically with colleagues. Rearing of bark beetles and parasitoids from experimental trees. Set up additional predator exclusion experiments using lessons learned from study trees.

Chapter 5 : Preservation - Bugwoodwiki

general principles for collection, preparation, and storage of insect specimens. The World 4 Curation of Insect Specimens National Park Service Conserve O Gram 11/8.

A Robinson light trap for collecting moths Insects are passively caught using funnels , pitfall traps , bottle traps , malaise traps , flight interception traps and other passive types of insect traps , some of which are baited with small bits of sweet foods such as honey. Different designs of ultraviolet light traps such as the Robinson trap are also used by entomologists for collecting nocturnal insects especially moths during faunistic survey studies. Aspirators or " pooters " suck up insects too small or delicate to handle with fingers. Aerial insect nets are used to collect flying insects. The bag of a butterfly net is generally constructed from a lightweight mesh to minimize damage to delicate butterfly wings. A sweep net is used to collect insects from grass and brush. It is similar to a butterfly net, except that the bag is generally constructed from more rugged material. The sweep net is swept back and forth through vegetation quickly turning the opening from side to side and following a shallow figure eight pattern. The collector walks forward while sweeping, and the net is moved through plants and grasses with force. This requires a heavy net fabric such as sailcloth to prevent tearing, although light nets can be used if swept less vigorously. Sweeping continues for some distance and then the net is flipped over, with the bag hanging over the rim, trapping the insects until they can be removed with a pooter. Other types of nets used for collecting insects include beating nets and aquatic nets. Once collected, a killing jar is used to kill required insects before they damage themselves trying to escape. However, killing jars are generally only used on hard-bodied insects. Soft-bodied insects, such as those in the larval stage, are generally fixed in a vial containing an ethanol and water solution. Entomological equipment for mounting and storage Equipment for preparation The usual method of display is in a glass-covered box, with the insects mounted on specially made non corrosive insect pins stuck into suitable foam plastic or paper covered cork at the bottom of the box. Common pins are not used. Very small insects may be pinned on "minuten" very tiny headless pins stuck into a block of foam plastic on a standard insect pin. Alternatively they may be glued onto a small piece of card on the pin. Techniques and equipment may be varied to deal with various species or requirements. For example, one or both of the wings of a beetle or grasshopper can be pulled open and fanned out to show the wing structure that otherwise would be hidden. At least the date and place of capture should be written or computer printed onto a piece of paper or card transfixed by the pin. This is called a data label. The insects are transfixed by entomological pins which allow handling and which also pierce the data label Rare insects, or those from distant parts of the world, may also be acquired from dealers or by trading. Some noted insect collections have been sold at auction.

Chapter 6 : Insect collecting - Wikipedia

Insect Curation: Part of the Biodiversity in the Schoolyard (BitS) unit. Authors: Ryan Hill, Nicole VanderSal, and Alison Purcell Overview: In this lesson, students will learn how to curate insects that they collected in previous lessons.

In the first, we focused on the biodiversity of organisms in the major deposits of the world, including the techniques available for distinguishing genuine fossils from fakes see Issue 26, Biodiversity of fossils in amber. When the first fossil amber specimens were examined back in the s, only very basic microscopy was available to examine the inclusions. In recent years, great progress has been made in amber preparation procedures, photomicroscopy and advanced imaging techniques, which can all now be employed in the study of fossils in amber. Optical properties of amber To understand the rationale for the preparation techniques described below, it is worth reviewing the way light passes through amber and the way that images are formed. Amber is usually transparent or translucent. The more transparent it is, the less the light is absorbed as it travels through the specimen. As opacity increases, more light is absorbed and inclusions become more difficult to see. Arthropod inclusions are visible because they have differing opacities and refractive indices to the enclosing amber. When light rays cross boundaries between media with different refractive indices such as amber and air they bend. If the surface is flat and polished, the light rays bend in a predictable manner and it is easy to see what lies within. If a surface is curved, irregular, undulating or scratched, the light rays bend in different directions, depending on where they come out, and the image is distorted. For maximum visibility, a specimen should be prepared with a flat, optically polished surface in the minimum depth of amber. A minimum depth is important, as variations in refractive index in the body of the amber produce optical distortions. Flaws, dust and other foreign bodies between an inclusion and the specimen surface scatter the light, reduce contrast and also make the inclusion more difficult to see. Many collectors and curators value large, intact amber specimens and it is not always possible, or even desirable, to cut and polish a specimen. Fortunately, there is a simple technique that can eliminate the distortions produced by a curved, irregular or scratched surface. Immersing a specimen in a fluid with a similar refractive index to amber dramatically increases its visibility. This technique reduces light scattering at the surface and eliminates the distortions produced by irregularities and curvature. Preparation of amber inclusions Once raw amber has been washed and cleaned, it is often possible to determine whether or not it contains inclusions by coating it with a thin smear of oil and holding it up to the light. The oil fills scratches and flaws on the surface of the amber, increasing the visibility of any inclusions that are present. When something of interest is discovered, further preparation is usually required. This typically involves cutting or grinding, and then polishing the amber. The first of these processes requires a circular trim saw ideally a faceting saw with a thin diamond blade. Chipping of the amber is minimized by rotating the specimen during the cutting process. Water is used as a coolant and lubricant to protect the specimen from overheating. Once it has been trimmed to size, the surface of the amber should be ground to remove saw marks and then polished. Check the specimen regularly under a microscope to avoid grinding it too much and damaging the inclusion. Saw marks are easily removed using a medium grade paper. Specimen and hands must be cleaned before transfer to , 1, and 2,grades. At each stage, a careful inspection of the surface is required, as even the tiniest scratches cannot be removed by polishing. A fine napped polishing pad, charged with a one micron diamond compound 14, mesh equivalent or nm alumina which is probably better, but takes a bit longer , can be used to produce a highly polished surface. The polishing compound is made up as a paste in water, which acts as a coolant to protect the amber and its inclusion from overheating. If the surface remains dull after a few minutes of gentle polishing using a figure of eight motion, the specimen should be returned to grade abrasive paper and the process repeated. When mechanical equipment is used, it is important to follow the safety instructions. The specimen should be rotated during grinding and polishing to get an even finish, because the outside of the lap rotates faster than the inside. With an anti-clockwise spinning wheel, it is easier to manipulate the amber with the wheel turning away from the operator, that is, the amber should be held on the right-hand-side of the wheel. Particular care should be taken to maintain a firm hold of the specimen. Should it slip, a fast-spinning wheel can transport it a great

distance in a random direction. Check the amber carefully for internal fractures. The forces generated during cutting, grinding and polishing can cause specimens to break. In some cases, they may be glued back together. It may then be possible to resume the preparation process without further damage to the specimen. However, this is not always the case. Techniques for preparing amber. A â€" Baltic amber spiders mounted on microscope slides by Alexander Petrunkevitch; B â€" Lebanese amber spider prepared by Dr Dany Azar for scientific study; C â€" basic grinding and polishing; D â€" embedding in clear, synthetic resin. Special techniques The clarity of most Tertiary amber, in conjunction with the excellent preservation of the fossil inclusions, means that cutting to an appropriate size, followed by grinding and polishing Fig. More elaborate techniques, using immersion fluids and embedding media of similar refractive index to amber have been developed by some researchers. Specimens can be immersed in water white oil of cedar wood or similar once they have been trimmed to the appropriate size. The refractive index of the oil is very similar to amber, so, using this technique, inclusions can be viewed from multiple angles by rotating the specimen in the oil. A variation on the above technique is particularly useful for brittle Cretaceous ambers, such as those from Lebanon. It is difficult to extract large specimens as they commonly shatter, so most inclusions are recovered from fragmentary material. The brittle nature and small specimen size makes cutting and grinding the raw amber impractical. Therefore, to prepare inclusions for study, it is best to shave slivers of amber from the specimen using a razor blade, getting as close as possible to the inclusion dorsally and ventrally. This is then placed in a deep fluid mount, made by gluing a shallow plastic ring to a circular microscope slide cover-slip, which has been filled slowly â€" so as not to create air bubbles â€" with Canada balsam. The amber is gently eased into the cell, taking care not generate bubbles, which, if formed, can be removed using a fine needle. Canada balsam has the same refractive index as amber and it seeps into any surface cracks, significantly increasing the clarity. A second cover slip is fixed onto the preparation using plastic cement. Once it has begun to set, the excess cement can be shaved off around the edge to create an aesthetically pleasing finish Fig. An innovative modification of the above technique was employed by scientists working on Cretaceous amber from France. The amber was shaved as close to the inclusion as possible, but from all sides rather than just dorsally and ventrally. The specimen was then glued to the blunt end of a thin pin. Four small glass panes were glued to a microscope slide to make a small cell structure. One of the panes had a hole in the centre, through which the pin was inserted with the inclusion on the inside. The pin fitted snugly but was free to rotate. This cell was then filled with Canada balsam and a thin glass pane was glued on top. When the specimen was viewed under the microscope, the pin could be rotated to view it from many different angles. Brittle ambers can also be mounted in blocks of synthetic transparent plastic Fig. This can be done to facilitate study as well as to preserve the specimen. This technique makes the amber easier to handle and prevents it from shattering during grinding and polishing. The block can be reset in fresh plastic as many times as desired to polish it from various angles. However, care must be taken to avoid unwanted air bubbles, but these can be minimised by allowing the plastic to set in a vacuum if possible. The result is a tiny, inclusion-bearing piece of amber, highly polished on many sides, set in the centre of a hard transparent plastic block. This is a time consuming process, but worth the effort for some specimens. It has the bonus of protecting the amber from accidental damage and oxidation through exposure to air. Hoffeins provides a short explanation and practical advice for undertaking this embedding process without access to specialised technical equipment. Collectors should find his paper particularly useful. It is important to choose a synthetic plastic that is as hard as the amber. If the plastic is softer, it grinds more quickly than the amber and can pull at the surface causing it to shatter. Attempts to dissolve Lebanese amber in chloroform to extract the inclusions have been successfully carried out. Articulated insect fragments, which retained their softness in a manner similar to freshly collected entomological material, were recovered. This process may seem absurd to some, as much of the beauty of amber inclusions is in the amber itself. However, to a palaeontologist, the inclusion is more interesting than the surrounding amber matrix and a technique that can separate the two has scientific merit. Indeed, it can be frustrating when museum curators will not permit further preparation of specimens for scientific study simply because of aesthetic concerns. Readers are cautioned that any attempt to dissolve out specimens may lead to loss of both the amber and the inclusion. Fly laying eggs in Dominican amber photographed by David Green

using different lighting techniques. A â€" blue background, with incident light from the lower right. Note how the blue background increases the visibility of the inclusion; B â€" orange background, with incident and transmitted light; C â€" black background, with incident light and dark ground illumination showing the details of the hairs to good effect; D â€" black background, with incident light from the lower right. Light microscopy and photography The preparation techniques described above are designed to facilitate detailed study of an inclusion. A simple hand lens may be useful for reconnaissance investigations, but more detailed work requires a stereomicroscope. It is important that the reader understands the difference between a stereomicroscope and compound microscope. The former has a relatively large depth of field, a large working distance and produces an upright, three-dimensional image of the object under investigation. The latter is designed to investigate thinly sliced specimens mounted on microscope slides. It produces a reversed image with almost no depth of field and is of limited use in amber investigations. Compound microscopes are only useful for examining fine details of inclusions in very thin sections of amber and for tiny micro-organisms. Lighting is important when examining amber inclusions â€" the more flexible the illumination system, the better. Transmitted from below and incident illumination from above is required, and the facility to produce dark ground illumination is a considerable advantage. Dark ground illumination produces an image of the object in scattered light and is very useful when examining fine details such as hairs on the legs of insects and spiders. Fibre optic light sources are commonly used to produce directional incident light. Transmitted and dark ground systems are usually built into the microscope base.

Chapter 7 : The preparation and curation of insects (Book,) [blog.quintoapp.com]

A. K. WALKER & T. K. CROSBY: The preparation and curation of insects. 55 S., 44 Abb. New Zealand Department of Scientific and Industrial Research and The Entomological Society of New Zealand.

Royal Entomological Society, - on going. Member, Insect Collections Managers Group, - on going. Member, National Council for Conservation-Restoration. International Journal for Parasitology: Parasites and Wildlife, 5 2: The origin or what has been. Gunter M, Brown PA Notes on conservation tests of failing collembola insecta micro-slide mounts. Entomology microscope slide conservation project. Brown PA The perfect relationship? Balmforth cabinets and The Natural History Museum entomologist.. Natural Sciences Conservation Group Newsletter, 9: Brown PA Conservation Accreditation, the story so far.. Natural Sciences Conservation Group Newsletter, 8: Brown PA Microscope slide collection storage, the horizontal or the vertical. How should slide collections be housed?. Brown PA Accreditation, the way forward â€" a personal view.. Natural Sciences Conservation Group Newsletter, 6: MA Museums Studies Course. Aphididae species group on Pistacia Anacardiaceae , with descriptions of new species and a key to emigrant alatae. Systematic Entomology, 19 2: Aphididae in relation to Karyotype and host plant, and a note on the Taxonomy of permanently parthenogenetic aphids.. Systematics Association special volume, Aphididae of Northern Europe.. Occasional Papers on Systematic Entomology, 5: Aphididae , in relation to host plant and morphology.. Bulletin of Entomological Research: Proceedings of International symposia, Smolenice, Czechoslovakia, September 9th - 14th, Aphididae with a description of a new species from the Falkland Islands.. Aphididae on Geranium macrorrhizum in Britain.. Journal of Natural History, Journal of Natural History, 17 6: Life Sciences - Insects Division. Aphid collection and microscope slide preparator. Research with Roger Blackman Insect Plant Division on aphid taxonomy, using computer statistical analyses, electrophoretic and genetic methods and preparing scientific papers.

Chapter 8 : Curation | OSU Bio Museum | Page 2

The preparation and curation of insects. New Zealand DSIR information series , 92 pages. The book provides details on the standards used in NZAC for preparing and curating specimens; however, a few sections are no longer relevant, such as how labels are produced and equipment suppliers.

Chapter 9 : For teachers | Community Pollination Project | Manaaki Whenua - Landcare Research

Conservation and curation Conservation of amber specimens is an issue of concern to private collectors and museum curators alike. Given the great antiquity of amber, one could be forgiven for expecting it to have achieved chemical stability and to be relatively inert.