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Title: Leaching and Degradation of Lipids in Zoological Fluid-preserved Collections

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Source: Moore, S. (2002). Leaching and Degradation of Lipids in Zoological Fluid-preserved Collections. *The Biology Curator*, *Issue 22*, 44 - 46.

URL: http://www.natsca.org/article/366

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across him in the NHM store at Wandsworth; he is an imposing figure when you're alone in semidarkness.

Specimens seem to be unable to attain the individual value that is attributable to art objects, unlike an 'art object' specimens remain a 'sample' or 'example'. Scientists appreciate specimens for the beauty of their form and function related to their developmental evolution, but they argue that this beauty isn't **aesthetic**. Yet artists like Damien Hirst challenge this relationship. This is not the first time art has shown us different ways of looking at things, African paintings on shields and ceramics were considered primitive by ethnographic establishment thinking, but when Pablo Picasso used these media as a source for his Primitivist period, he destabilised the legitimate viewpoint. Rather than evidence of a primitive society, African painting became creative, it became a communication

between people, and became art. The more you look at specimens the more you see the "unnatural" representation of nature. What you see is the person who created the object - the taxidermists have added something of themselves. Specimens are evidence of a society, and they are a communication of our relationship with nature.

Science comes out of the revulsion from what was seen as the chaotic thinking of the Renaissance. At that time, early protomuseums existed in the form of Cabinets of Curiosity, where the emotive was as important as objectivity to an observer's examination of the universe, but secular authority came to pin this examination down to an objective basis. This objectivity has made the observer unaware of the unusual and macabre nature of the specimen. We take beautiful living creatures and turn them into something that invariably looks macabre by adding preservative and storing them in a museum. Yet this quality of museums' has drawn people who are repelled and yet fascinated by specimens, by the atmosphere, by the aura of death. Modern museums brighten up the atmosphere with modern displays, but by removing the macabre image we are stripping the material of some of its quality. As an alternative we create plastic and palatable exhibitions, with make up, glass eyes and benevolent expressions.

Science is a palatable 'mask' for the 'face of nature' that literally hides the subjective context of our relationship with specimens. Can museums utilise alternative values without negating science? Science already lends legitimisation to the BBC's programme 'Walking with Beasts', which mixes science fiction and science fact. Museums already paint specimens and construct false animatronic models that tantalise the observer with visions of living motion. I am not suggesting that museums should invite the audience to view horrors but allowing the audience to relate to specimens in freer way might make them more alive for them.

Leaching and Degradation of Lipids in Zoological Fluid-preserved Collections.

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Most, if not all, of us have to maintain fluid-preserved collections of natural sciences material. There are many problems associated with maintenance of such collections and where the problem of lipid leaching occurs, mammals, including Damien Hurst's lamb, invariably head the list. Those that come from polar regions of the world, cetaceans especially, are among the worst offenders and during the early stages of fluid preservation these should be stored in an area where they can be observed by passing members of staff.

The preparation of specimens for freeze-drying requires defatting either through solution in acetone - in which case all traces need to be washed out following treatment or the solvent action of the acetone will damage the freeze drier unless you happen to have an in-line charcoal filter. Alternatively, the fat

bodies can be physically cut out and replaced with modelling clay to prevent the skin from collapsing. Lipocytes emptied through solution of their contents, will similarly collapse upon drying and require rehydration to fill the empty lipocyte spaces with water [Fig. 1].

Other lipid-problematic specimens include fish which contain much lipid-bearing oil, especially in their livers and many of us may remember those days of dissecting dogfish for A level and having to root around in a bin of specimens redolent of formaldehyde and the vile smell of gradually oxidising lipids.

How does such a problem occur? Bear in mind that lipids are only preserved by fixatives such as formaldehyde/formalin and osmium tetroxide, so that they tend not to stay *in situ* but gradually seep out into the fixative or preservation fluid. Alcohol will dissolve them and then, as the alcohol gradually evaporates, the lipids start to re-appear as an emulsion. Since most lipids float, they travel to the top of containers which have probably been lovingly enshrouded with external labels, hiding the escaped lipids from view for long periods. The lipids slowly react with air at the top of the jar and oxidise turning to fatty acids, a problem written up by Dingerkus (1982). Such a reaction, especially if catalysed by a warm storage area, can also lead to denaturing of alcohols to carbon dioxide and water!

To understand this better, look at the molecular structure of some typical lipids. A molecule of monoglyceride lipid has a typical single chain hydrocarbon structure, whereas a triglyceride comprises a triple chain - 3 times the molecular weight [Fig. 2]. Note the oxygen atoms at the linkage end of each chain; it doesn't take much for these to acquire extra oxygen atoms resulting in an all-too-familiar -COOH fatty acid anion, such as that on the end of the linolenic acid structure [Fig. 3].

Over time, the lipids continue to leach, accumulate and oxidise and slowly the fluid changes colour through yellow to orange, brown and finally a lipid-saturated cloudy brown: a mixture of emulsifying lipids and animal tissues that are being slowly denatured by the fatty acids. I have treated a stoat preserved in such contaminated alcohol that the fluid actually gave a pH reading of 3.6. The acidity of the solution, not surprisingly, had the undesirable effect of decalcifying the stoat's skeleton, so that after several changes of fresh alcohol to remove the lipid clogging the fur, the stoat just sat in an untidy heap at the bottom of the museum jar!

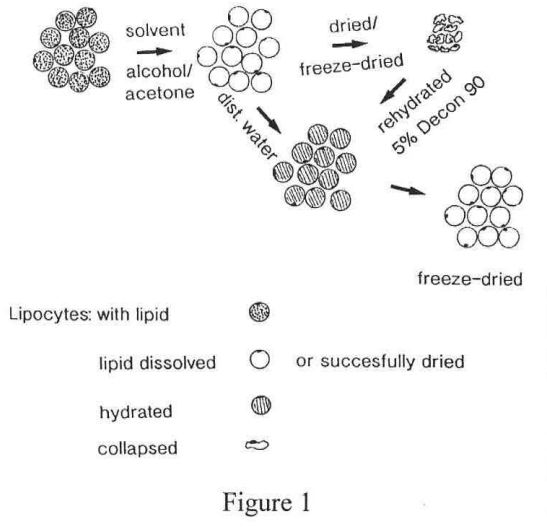

Figure 1

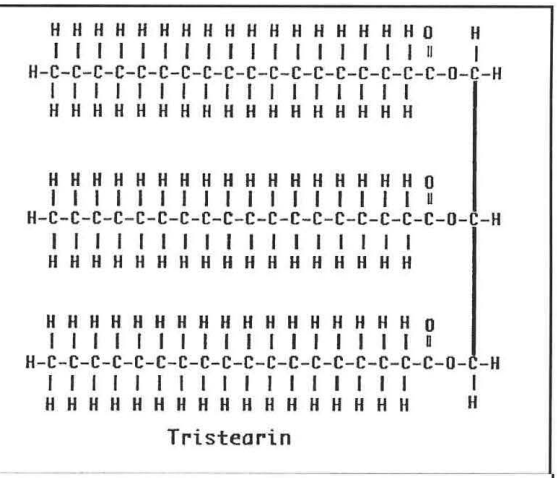

Figure 2

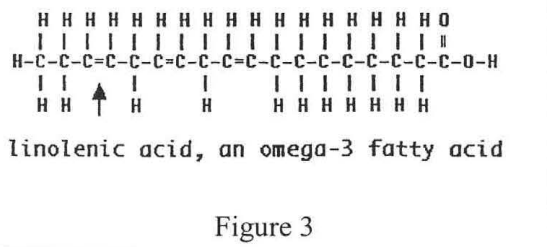

Figure 3

To show the effect of lipid removal from tissues using alcohol, Figs 4-5 show frozen-sections of rat liver with the ring-like lipocytes filled with lipids, stained red by the Herxheimer oil-red 0 technique. After a brief dunk in alcohol, the lipid dissolves into the alcohol leaving the lipocyte empty.

To test preserving fluids for lipid content, simply pipette some of the fluid into water, if there is any trace of turbidity, due to lipids coming out of solution to form an emulsion, it will show that lipid contamination has taken place.

Fluid-preserving fresh organ specimens, such as a pig's liver, can present its own leaching problems since such an organ contains bile salts including large amounts of sodium tauro- and glycochollates, together with a fair amount of lipid which all seep out into the preserving solution over the first month or so of preservation, following fixation, and producing an undesirable yellow tinge to the fluid combined with a whitish gelatinous suspension!

Back street taxidermy often results in fat burn to skins of vertebrates combined with other lipid-related problems, due to short-cutting and non- removal of fat bodies. Such a case in point is the Ganges Dolphin displayed in Tring Zoological Museum, prepared in haste, I suspect, by a local (Ganges) taxidermist. On a fairly recent visit I observed lipid pooling on the skin which had been burned dark brown or even black where the fatty acids had degraded the skin Fig. 6. Even the tail flukes, resting against the old-fashioned hessian cloth had stained it with a pool of lipid.

Finally, another problem can arise with contaminated preservatives -fungal hyphae will form in diluted alcohol, even if only diluted to about half of its normal strength. The only answer to obviate all of these problems is regular checking.

Now that you understand the signs of and reason for this type of degradation I am sure that with next year's reduced budgets and staffing levels you will still be able to check your collections with some regularity?

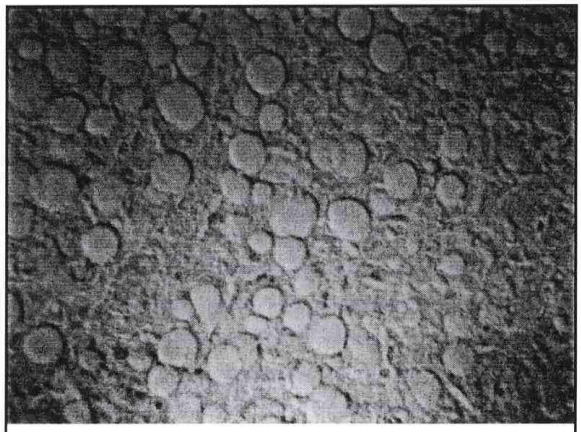

Figure 5

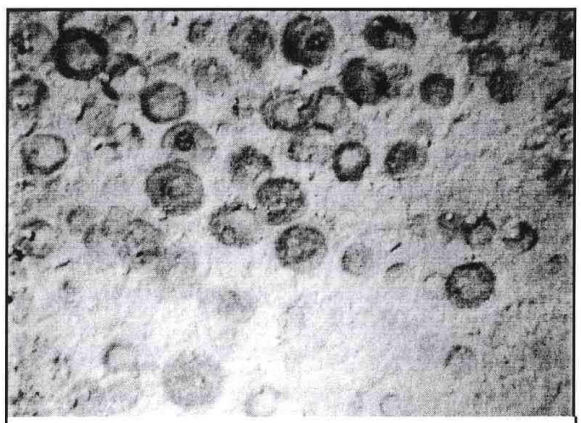

Figure 4

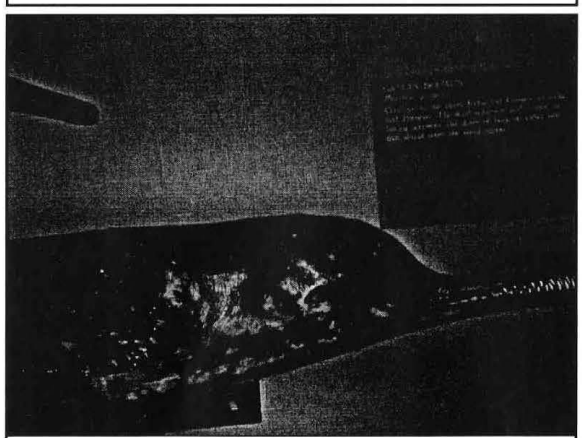

Figure 6

Reference.

Dingerkus, G. Preliminary observations on acidification of alcohol in museum specimen jars. Curation Newsletter of American Society of Icthyologists and Herpetologists 5: 1-3.