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CORRESPONDENCE

Museum collections — resources for biological monitoring

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The "colonial explorer" image was about exploration and conquering exotic lands. Specimens of everything that was encountered were collected and often later donated or sold to museums. This approach became unpopular because it encouraged over-collecting of natural areas to make money selling specimens to museums. The reason for collections and collecting needed re-inventing, and a resource/conservation/heritage approach was adopted. There are problems with the heritage approach as it is primarily static when collections need to grow. The modern trend in museums is to collect only voucher specimens or specimens that fill taxonomic gaps in collections (Oberholzer 1988). This is to protect local biodiversity and is also often because of space and human capacity constraints in museums caused by lack of sufficient funding for taxonomic research; the latter is evident over the last decades on the national (Herbert 2001; Smith *et al.* 2008), as well as on the global scale (e.g., Boero 2010; Pyke & Ehrlich 2010). There has also been a tendency for South African museums to specialise in certain groups, rather than to curate specimens from all orders. Although this makes sense in the light of space and capacity limits, it creates the real possibility that certain areas of the country will be undersampled because a museum that collects a particular order lies in another part of the country. There are thus reasons to revisit this approach to museum collections.

In 2009 an outbreak of urticating bristly caterpillars *Euproctis rufopunctata* Walker, 1862, the red-dotted Euproctis, in a suburb of Durban, raised a number of public concerns (Sanpath 2009). This moth belongs to the family Lymantriidae, the tussock or gypsy moths. The caterpillars have bunches of upright bristles on their bodies and these are responsible for causing skin irritations in humans. The adults have white wings with a few red dots and also have barbed defensive setae that are irritant to humans (Pinhey 1975). Apart from appearing in very large numbers and causing allergic reactions in people, the real concern was the timing of this outbreak—June and July. As this is austral winter and these are the cooler months in Durban, large numbers of insects are not expected to thrive. The outbreak raised a number of questions regarding the life cycle of these moths and how often these outbreaks might occur, given current public concern about global warming. Very little information is available on these topics. By consulting the database in the Entomology Department at the Durban Natural Science Museum, it was found that the last specimens of this moth added to the collection were from 1994 and no moths were collected between 1994 and 2009. Since this species is a noticeable and, potentially, a pest species, it would be unusual for an outbreak to occur and for specimens to not be brought to the attention of the museum staff. This may suggest that the 2009 outbreak is not a cyclical outbreak, and raises the

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question of whether it might well be a response to long-term change in environmental conditions.

Similar outbreaks of large numbers of *Achaea lienardi* moths were reported at the beginning of 2009 in both the Eastern Cape and KwaZulu-Natal (Vlok & Villet 2009). Although these moths were very destructive, stripping trees in the Eastern Cape, they do not generally cause allergic reactions in people. The last specimens added to the Durban Natural Science Museum collection are from 1996. If specimens of *A. lienardi* were collected every time they appeared, the museum collection would provide a good indication as to whether the most recent outbreak is unusual or just part of this moth's normal population dynamics. Indeed, the last major outbreak of *A. lienardi* was in 1996, and stretched from Durban to Port Elizabeth (Villet, pers. comm.).

In 2008 large numbers of leaf hoppers were reported to be "killing" flamboyant trees *Delonix regia* in Durban (Cole 2008). These leaf hoppers were *Cerneura delonixia* Ghauri (1978), an introduced species. There are no previous specimens of this leafhopper in the museum collection. This might be an indication of a lack of collecting rather than an absence of this insect prior to the outbreak in 2008. However, if the leafhoppers had been collected when they were first discovered, it would help to track when and where these insects were introduced to the country. Such museum records helped to illuminate the timing and place of the introduction of foreign blowflies to South Africa (Williams & Villet 2006).

The three examples mentioned above come from only one institution, and there are several others in the country, each of which can tell similar stories. Collectively, they suggest that sustained collecting, not just "gap filling", by museums has a valuable role to play in scientific monitoring, an idea that is strongly supported by Suarez and Tsutsui (2004). It also supports the proposal that amateur collectors and members of the public should be encouraged to donate specimens to museums to enlarge our knowledge and resource base.

Museum natural science collections have traditionally been used as a resource for taxonomic research. Such collections have also demonstrated a growing potential for understanding ecological and environmental issues (Pyke & Ehrlich 2010), including determining potential outbreaks and monitoring the introduction of invasive species, as has been shown in the examples given. Due to lack of financial, infrastructural and human resources, museums are forced to specialise in certain groups. This leaves many other groups poorly represented in collections in the country as a whole, as there are not enough museums to cover all the insect orders. Certain areas of the country are also poorly sampled, as financial constraints limit collecting trips. Without strong financial support and policy implementation, the potentially extensive uses of collections will never be achieved. This is a very important fact that needs to be acknowledged at management level to bring about policy changes regarding financial support for collecting and the uses of the collections beyond their taxonomic value.

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