

In Praise of Juvenility: The Increasing Significance of Ontogenetic Series in Zoological Collections of Natural History Museums

Dmitry V. Ivanoff

National Museum of Natural History, National Academy of Sciences of Ukraine

Похвала ювенильности: возрастающее значение онтогенетических серий в зоологических коллекциях естественноисторических музеев. — Иванов, Д. В. — Исторически сложившийся в музеях акцент на сборе экземпляров взрослых особей животных не способствует решению ряда фундаментальных проблем современной эволюционной биологии, требующих изучения всех онтогенетических стадий. Естественноисторические музеи могут внести более весомый вклад в развитие этих актуальных направлений, уделяя особое внимание пополнению зоологических коллекций ювенильными экземплярами.

Historically, zoological museums have been primarily focused on collecting the specimens of adult animals. From the typological standpoints of early natural history and then systematics, the immature individuals was thought to be of rather little significance as compared to those fully grown and representing the definitive morphologies. This long-known and widely recognised approach has, with very few exceptions, resulted in the strong under-representation of juvenile specimens even in major museums of international standing. As a consequence, the development of most species is entirely unknown and cannot be examined based on the available museum holdings.

This bias seems to be particularly true of mammalian juveniles, which have always been and still are rarely collected even in the case of abundant and extensively sampled taxa. For example, less than 3% of the cranial collection of wild Canidae in the National Museum of Natural History, Kiev, is comprised of cub skulls, and my survey revealed very similar percentages in 20 other European museums, with little dependence on the total amount of specimens and represented taxa.

The purpose of this report is to call attention of the museum community to the increasing scientific importance of juvenile specimens. Their paucity in the natural history museums is becoming unnatural and outdated because an array of questions in modern biology can only be answered with the use of such material. The potential applications range from monitoring of the growth and de-

velopment in specific populations to addressing some of the most fundamental problems in evolutionary biology, including evo-devo. Representative ontogenetic series are necessary for studies of the temporal and spatial patterns of phenotypic development, including timing, variation, modularity and homology of morphological structures for their use in phylogenetics of extant and fossil taxa and for deeper understanding of evolutionary processes in general.

In view of the ever-growing interest in these fields, currently fuelled by studies of molecular mechanisms of development and applications of advanced imaging and morphometric techniques, collecting juvenile specimens deserves more attention from natural history museums. The importance of juveniles warrants every opportunity to be taken in obtaining their specimens to eventually accumulate developmental series, either liquid-preserved or carefully cleaned skeletal, representative of as many species as possible.

The potential sources might include, but not be limited to, donations from research institutions and (considering that high juvenile mortality is ubiquitous) from zoos, veterinarian clinics, nature and game reserves or private animal keepers, hunters and occasional collectors of dead specimens. It is the natural history museums that can and hopefully will play the most active role in making this material available to science. The collections of juvenile animals are not something of only marginal importance, but a treasure trove.