

# University Grants Commission, New Delhi

## Guidelines for discontinuation of dissection and animal experimentation in Zoology/ Life Sciences in a phased manner

### **A) Pre-amble:**

Animal dissection as an aspect of Zoology curriculum is about ninety year old. Over the years there has been a tremendous expansion of knowledge content of Zoology in the light of emergence of newer branches such as biodiversity, biochemistry, biophysics, molecular biology, etc. Thus, in the contemporary scenario, there is over-emphasis of learning of anatomy as laboratory exercises. It has been felt that the curriculum must be revamped to accommodate the latest developments where in there is pertinent need to underplay animal dissections. Further, when there were fewer higher learning institutions and fewer students, fewer animals were used in dissections. Now the number of such institutions has become manifold and more than a million students take to programs requiring animals for dissections. Most of these animals are caught from the wild, and their indiscriminate removal from the natural habitats disrupts the biodiversity and ecological balance. Thus, use of animals in dissections has come to be a factor compounding with habitat loss, pollution and climate changes in depletion of animal populations. It is a fact that the demand for dissection specimens increases pressure on threatened species. The case of frogs, the population of which has declined to alarming levels in the recent times, is often cited as the example. Also, it has been noticed that laws/regulations/guidelines about animals and their welfare are not taken to cognizance while prescribing animal use in the curriculum. Citing these and other reasons, representations have been received at the University Grants Commission (UGC) office with request to review the use of animals in education, particularly in dissections. In consideration of the seriousness of the issue, UGC convened an Expert Committee, and after a brain-storming session, the Committee came up with specific recommendations in this regard. These recommendations aimed at suggesting to the UGC to take up the issue of discontinuation of dissection and animal experimentation in Zoology/ Life Sciences in

a phased manner. The Committee believes that these recommendations, which are in the form of 'immediate actions' and 'long term actions', may be treated as a 'road map' for curricular transformation in Zoology/Life Sciences in the Indian Universities and Colleges. The recommendations were approved by the UGC and Ministry of Human Resource Development (MHRD), and the following Guidelines are issued for the implementation of these recommendations. These Guidelines will apply to all departments in universities and colleges which deal with animals in teaching and learning.

### **B) Objective/Aim to be achieved:**

**Dissection of animals for class work is to be replaced in a phased manner with the acquisition of appropriate technology and the development of human resources for the same.**

#### **B.1) Immediate Actions:**

##### **B.1.1) Recommendation 1:**

All Institutions of Higher Education to strictly adhere to the Wild Life Protection Act, 1972 and the Prevention of Cruelty to Animals Act, 1960.

##### **Guideline 1:**

The Constitution of India, under Section 51A (G) states, "it shall be the duty of every citizen of India to protect and improve natural environment including forests, lakes, rivers and wildlife, and to have compassion for all living creatures". Sec 17.1 (d) of the Prevention of Cruelty to Animals Act, 1960, requires that experiments on animals are avoided wherever it is possible to do so; as for example; in medical schools, hospitals, colleges and the like, if other teaching devices such as books, models, films and the like, may equally suffice, and Sec 17 (f) requires that, as far as possible, experiments on animals are not performed merely for the purpose of acquiring manual skill. The Wildlife Protection Act, 1972, amended from time to time, has all Elasmobranchii (sharks and rays) included in the Schedule I, and all frogs belonging to genus Rana included under Schedule IV. Therefore, all educational institutions coming under the purview of UGC

shall prescribe laboratory curriculum involving animals in such a way to be compassionate with the animals, avoid experiments on animals, wherever possible, and use alternatives in their place, experiments on animals are not performed merely for the purpose of acquiring manual skill, and not to use animals protected under the Wildlife Protection Act 1972, particularly frogs belonging to genus *Rana* and any elasmobranch fish, in laboratory exercises. It is important that the direction in UGC circular No. F.14-4/2006 (CPP II) is strictly adhered to. Further, "Animal Ethics" should be included as a chapter in an appropriate course of study. In order to sensitize the students and other stake-holders, the departments shall display the highlights of the Acts mentioned vide supra, in the laboratories and elsewhere. The Departments may also adopt other modalities to popularize the science and sentiments of the provisions of these Acts. The curriculum should be revised to accommodate this Guideline.

**B.1.2) Recommendation 2:**

All Institutions of Higher Education to constitute "Dissection Monitoring Committees" (DMC) to look into the use of animals, and UGC to provide guidelines for the same.

**Guideline 2:**

Every educational institution, coming under the purview of UGC, which is engaged in dissection of animals and experiments using animals, shall constitute a Dissection Monitoring Committee (DMC), the composition and powers of which shall be as follows:

- 1) The DMC shall be different from the Institutional Animal Ethics Committee (IAEC), under the purview of Committee for Purpose of Care and Supervision of Experimental Animals (CPCSEA), Department of Environment and Forests, Government of India. However, the DMC shall not have powers over-riding the powers of IAEC. For animals covered by the IAEC, the Standard Operating Procedures (SOPs) for IAECs prescribed by CPCSEA will apply.
- 2) The Head of the concerned Department shall be the Convener and Chairperson of DMC. Two senior faculty members of the concerned Department, one faculty member of a related Department from the same institution and one or two faculty

members of the concerned Department from a neighboring institution(s) shall be members.

- 3) The tenure of DMC shall be 2 years, and on expiry of a term, the DMC should be reconstituted wherein only the Convener and Chairperson (the Head of the Department) may continue for two or more terms if he/she happens to continue to be the Head of the Department.
- 4) A vacancy arising during the tenure of a DMC shall be filled with a faculty belonging to the respective category.
- 5) The DMC shall be convened by giving one week written notice to the members.
- 6) The quorum for the meeting shall be 3 out of 6 where in at least one member from the neighboring institution must be present.
- 7) The DMC shall meet at least once each semester/half year and approve/review use of animals in dissections/experiments for laboratory exercises, within the purview of the Guidelines here in.
- 8) It shall be the responsibility of DMC to ensure that animals that are permitted to be used for dissections/experiments in the Guidelines herein are procured from ethical sources, and not removed from the wild for these purposes, and transported to the laboratory without stress or strain to the animals if alive and anesthetized appropriately if they are to be used in dissections.
- 9) The Institution shall maintain appropriate records of procurement of animals, their transport if alive, number of animals used, use of anesthesia/euthanasia if applicable, etc.
- 10) The DMC shall scrutinize the records thus maintained.

**B.1.3) Recommendation 3:**

For both UG and PG programs, there shall be reduction in the number of animals for dissection and experimentation as well as in the number of species with all ethical considerations. Preference shall be given to laboratory bred animal models.

**Guideline 3:**

This recommendation will be largely applicable only to animal use in experiments excepting for ethical treatment of animals since the Recommendation 4 hereunder limits and specifies the animal use in dissections. Here in, animals used in experiments should be, to the best extent possible, procured from laboratory bred sources, especially breeders approved by CPCSEA in which case their use will be under the purview of IAEC. Removal of animals from their natural habitats should be best avoided.

**B.1.4) Recommendation 4:**

For UG: **'Only one species'** to be adopted for **'demonstration only'** by the faculty and **'students should not do any dissection'**. In lieu of this, Curriculum must be developed to encourage students to take up field work.

**Guideline 4:**

4.1 For undergraduate programs, both at major and allied levels, the students shall not be required to dissect any animal. The Curriculum Board, if of the opinion that these students should be exposed to internal organization of animals, may prescribe anatomy of any one animal species which can be, bred/cultured on a large scale. Here, the teachers shall only demonstrate the dissection of one or more aspects of anatomy, which the students will observe and record. Coming to examination, if at all found necessary, the students may be required to flag label specific parts in the specimens already dissected by the teachers and kept ready.

4.2 The curriculum for Invertebrata and Chordata, as the case may be, theory as well as laboratory exercises, shall be oriented towards levels and patterns of organization, bio-systematics, biodiversity, adaptations, developmental stages, population dynamics, ecological implications, etc. The laboratory exercises here will make use of museum specimens (if only already available) and microscopic preparations, photographs, video clippings, models, charts, plastinated specimens, field observations combined with photography and/or videography, and so on. Intermittent field visits should be arranged. In extreme cases, the visits may be limited to an area in the vicinity of the college campus, such that the students become familiar with the fauna available in and around the place.

The Board of Studies should list the animals/animal groupings in the curriculum, in a flexible framework such that the final choice of the specimens, and not the number and category, will be at the user end. The examination here will be more oriented towards knowledge component rather than skill development.

4.3 If animal anatomy is emphasized, the laboratory learning may make use of plastinated dissected specimens and/or digital alternatives, which are now available from commercial sources in plenty, such as ProDissector Frog, BioLab Frog, DigiFrog, Dissection Works, and so on, information about which is available on the websites. Several such alternatives available on the websites and freely down-loadable may also be used. Many of these digital learning devices have modules for testing, which can be used to evaluate the students at the examination. Separate budgetary provision should be made by the concerned institution for the procurement of digital material and technology.

4.4 It is important that during the field visits the students shall only observe the animals and make record of the observations; the animals shall neither be killed nor removed from the natural habitat. To that effect, the students should be told about the importance of biodiversity and its conservation.

**B.1.5) Recommendation 5:**

For PG: Students shall have the option to perform dissection of 'selected species' as per the curriculum or to have a project related to biodiversity/biosystematics, etc.

**Guideline 5:**

5.1 The Guidelines 4.1-4.3 above will apply here by and large, but the dissection component will be a little more liberalized.

5.2 Here, the curriculum shall provide for a choice to be expressed by the students, whether to take to dissection of animals or go for a project related to biodiversity and/or biosystematics.

5.2.1 For those who opt for dissection, the curriculum may prescribe dissection of very few designated specimens, may be one from invertebrates and one from chordates. In the choice of the animal(s) here, the Guideline 4.1 above will strictly apply.

5.2.2 The PG students may be required to learn Physiology and such other subjects in the laboratory using computer simulation learning devices and avoid use of animals in experiments and, thus, their removal from the wild for this purpose.

5.2.3 Students who opt for the project shall be taken to field/museum visits and/or permitted to make use of ICT learning tools, and they will be provided with the necessary facilities. The examination here will assess the project report in terms of content, genuinity, knowledge gained, etc.

## **B.2) Long Term Actions:**

### **B.2.1) Recommendation 1:**

Human Resource Development through training programs towards adopting alternative modalities for animal dissection.

### **Guideline 6:**

Guidelines 4.3 and 5.2.3 above touched upon digital alternatives for animal anatomy and physiology. These and several other digital alternatives are already available, and make laboratory learning much more rewarding than wet lab exercises. Since these are ICT based, the teachers need to be trained in these alternatives. The UGC shall sponsor 3-5 day dedicated workshops for this purpose through Academic Staff Colleges / University Departments / Colleges, with the help of Organizations with experience / expertise in the field.

### **B.2.2) Recommendation 2:**

Software development for alternative modalities for animal dissection, experimentation and dissemination.

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**Guideline 7:**

Even though digital alternatives/simulations are already available, it is important that newer software/simulations contextualized to the Indian context need to be developed. Being one of the Software Giants of the World, appropriate software should be developed in India and be made available in downloadable form to the institutions without cost, as an aspect of INFLIBNET. To this effect UGC will organize a brain-storming session for an interaction between experts in dissections and/or experiments and software developers to be identified appropriately, and then arrange to develop the software either in a direct role of UGC or through a nodal agency/organization that will be identified.

**B.2.3) Recommendation 3:**

Empowering Zoology/Life Sciences departments with appropriate information communication technology (ICT) for implementing the above recommendations.

**Guideline 8:**

To facilitate the above said recommendations, all departments dealing with animals for teaching and learning should be empowered with infrastructure to adopt the ICT required for the purpose, for which additional assistance will be provided by the UGC.

**B.2.4) Recommendation 4:**

Curriculum related to invertebrates, vertebrates, etc., to be enriched with bio-systematics, population dynamics, evolution and bio-diversity, etc.

**Guideline 9:**

To achieve the above goals the subjects mentioned in the recommendations should be integrated as part of the curriculum of the respective disciplines. The approach could be as in the listed learning resources appended. The UGC will evolve a model curriculum in this regard.



## Appendix I.

- *Animal Diversity*. Cleveland P. Hickman, Larry S Roberts, Susan L. Keen, Allan Larson, David Eisenhour. McGraw-Hill Higher Education, 2008.
- *Animal Diversity*. Diana R. Kershaw. University Tutorial Press, 1984.
- *Animal Diversity: A Textbook of Invertebrate Zoology*. Eylers. Mosby, Incorporated, 1991.
- *Laboratory Studies in Animal Diversity*. Cleveland P. Hickman, Lee B. Kats. McGraw-Hill Higher Education, 2008.
- *Digital Zoology: Version 2.0 CD-ROM and Student Workbook*. Jon G. Houseman. McGraw-Hill, 2003.
- *Laboratory Studies in Animal Diversity*. Cleveland P. Hickman, Lee B. Kats, William C. Ober. McGraw-Hill, 2006.
- *Glencoe Science Modules: Life Science, Animal Diversity*, Student Edition. Lucy Daniel, Dinah Zike. McGraw-Hill, 2007.
- *Invertebrate Zoology: A Functional Evolutionary Approach*. Edward E. Ruppert, Richard S. Fox, Robert D. Barnes. Thomson-Brooks/Cole, 2004.
- *Invertebrate Zoology: A Laboratory Manual*. Robert L. Wallace, Walter Kingsley Taylor. Prentice Hall, 2002.
- *Vertebrate Zoology: An Experimental Field Approach*. Nelson G. Hairston. Cambridge University Press, 1994.
- *General Zoology Laboratory Guide*. Charles F. Lytle, John R. Meyer. McGraw-Hill Higher Education, 2008.