

Topic:
Contribution of Systematics to Biology

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The contribution of Systematics to biology can be studied into two heads:

[A] Theoretical biology & B. Applied Biology

[A] Theoretical biology

Systematics has played some important role in the field of theoretical biology.

Such as -

- It is responsible in making conceptual contribution like population thinking.
- It is responsible in solving the problems of multiplication of species. It illustrates the structure of species and evolutionary processes.
- Mimicry and other evolutionary areas also have been a clearly understood through taxonomy.
- It has also played important role in the development of behavioural science.
- Taxonomy is the key to the study of Ecology, as no ecological survey can be undertaken unless all the species of ecological importance are identified.

[B] Applied Biology

Systematics provides basic understanding about the components of biodiversity which is necessary for effective decision making about conservation and sustainable use. The most important are -

1. Agriculture & forestry

Presently we are faced with the acute problem of saving our crops and

trees from the attack of various kinds of pests.

Thus, it is necessary to know the correct names of such pests, before their proper control and eradication.

Taxonomists can give correct identification of pest species, which is vital for its effective control.

Similarly, many of the plant diseases are caused by certain vectors. The correct identification of a particular vector is vital for bringing the vector under control by killing its transmitters.

2. Biological control

Natural enemies of pests can be introduced for biological control of pests. The biological control is much more economical than the chemical control.

The systematists are presently greatly involved in designing and implementing the biological control programmes of pests and diseases most effectively.

3. Public health

Taxonomy plays an important role in public health programmes also. There are number of diseases, which are spread by many Astrofods. So, our controlled measures should be planned to attack the target species.

As for example, All Anopheles maculipennis are not responsible for transmitting malaria. This species consists of several sibling species, of which a few were identify this particular sibling species.

A correct identification ensures a max^{im} of effective control at minimum cost.

<4> Quarantine

Many new pests and diseases of plants, animals and human beings can spread from one country to another through transportation. Respective governments have established quarantine laboratories at ~~and~~ ^{air} ~~air~~ ^{ports} ~~air~~ ^{airports}, ports etc. to check such transmission. Taxonomists play a vital role here in prompt identification of these pests and diseases.

<5> wild life management

Presently great attention is being paid to conserve and propagate wild life. The indiscriminate killing and felling of trees have already resulted in great disturbance in the natural environment.

Taxonomists can help all environmental protectors by identifying the economically and ecologically important wild life. The task is important for the preservation and protection of our biodiversity.

<6> Mineral prospecting

The identification of fauna and flora ~~in~~ ⁱⁿ sedimentary rocks gives a clear picture of the sequence of geological events, which help in search for fuels and mineral deposits.

The paleontologists play a major role in the identification of such fossil specimens of the sedimentary rocks and thus give us a clear picture of the ~~at~~ ^{the} correct sequence of geological events.

(7) National defence

Vectors and parasites in an obvious application of systematics to national defence. The use of biological means in the war is economical and requires fewer efforts in their operation.

8) Environmental problems

Taxonomists have played an important role in detecting some of the environmental problems.

Certain pesticides are entered in the food chain of ecosystem and biomagnification of pesticides takes place at certain trophic level. Here, a taxonomist can play important role in detecting such problems and can take effective measures to control it.

Presently, water pollution is considered as a major environmental problem. Certain planktons are reliable indicator of the degree of water pollution. The identification of such organisms by taxonomists give rapid information for detecting pollution.

9) Soil fertility

Some organisms play important role in increasing the fertility of soil. So, it is necessary to know such animals for their proper management in agriculture.

10) In Commerce

Many animals and animal's products are used commercially by human beings such as - honey, silk, lac, dyes etc. Systematics play important role in increasing and improving the qualities of these products by manipulating the useful species.