Disseminating Biodiversity Information

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ABSTRACT

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A methodological approach for improving description, classification and identification of specimens in difficult taxonomic groups.

In groups were classifications are subject to a lot of revisions (because they are not well known), experts are reluctant to disseminate biodiversity information to general public. In such taxonomic groups, there is a need for research-oriented systems dedicated to computer-aided systematics.

To answer this problem of expertise, we have built user-friendly computer tools based on the application of the scientific method in biology (experimenting and testing):

- Acquiring a descriptive model by defining dependant observable objects and characters,
- Collecting structured and pre-classified observed descriptions (cases) with an automatically built questionnaire that matches the descriptive model,
- Processing the cases to learn inductive hypothesis (classifications), and testing them with new observations for identification (by determination with rules or by matching with case-based reasoning),
- Validating the learnt knowledge: the expert can update the knowledge base according to the results obtained during classification and/or identification, and thus improve iteratively his descriptive model and case base.

This knowledge acquisition method has been tested on a sponge domain (genus *Hyalonema*, 125 cases, 25 objects, 46 characters) and is currently applied on Scleractinians (genus *Pocillopora*, about 40 cases). It shows the central role played by the descriptive model. This is an observable descriptive tree on which cases can be compared with one another from the structure of their dependant objects. More fundamental is the capacity to build such a model with the group of specialists (isolated in space and time) after a common inventory (thesaurus) on a target taxon (family or genus). This collective work with the same method is a preliminary task to the elaboration of a complete knowledge-based system from specimens. This approach is worth being experimented by systematician users in a project relative to high-speed networks in Europe, in order to improve the quality of the disseminated information.