

SPECIES, EASY TO CREATE, DIFFICULT TO DESTROY

Peruzzi, L.

University of Pisa, Department of Biology, Unit of Botany, Via Derna 1, 56126 Pisa, Italy

lorenzo.peruzzi@unipi.it

A summary of different *species concepts* and their application in plants is presented, up to a tentative unitary definition, excerpted from Warren Wagner's work (1984):

In the light of present usage, I would define *species as a convenient taxonomic category that defines a unit of organismic diversity in a given time frame and composed of individual organisms that resemble one another in all or most of their structural and functional characters, that reproduce true by any means, sexual or asexual, and constitute a distinct phylogenetic line that differs consistently and persistently from populations of other species in gaps in character state combinations including geographical, ecological, physiological, morphological, anatomical, cytological, chemical, and genetic, the character states of number and kind ordinarily used for species discrimination in the same and related genera, and if partially or wholly sympatric and coexistent with related species in the same habitats, unable to cross or, if able to cross, able to maintain the special distinctions.*

Different ways to be a species need obviously different experimental approaches to taxonomy. However, the main problem is that the vast majority of described (and currently accepted) species in plants are still in the so-called William Bertram Turrill's "*alpha*" taxonomy. You may think that it is a problem limited to species described in the past, but this is not the case! In addition, even in those groups where more or less accurate biosystematic studies were carried out (i.e. Turrill's "*beta*" to "*omega*" taxonomy), rarely the obtained results give a direct evaluation of the biological relevance of a species or of the evolutionary processes underlying it; more often, these experimental results allow only indirect, not resolute, inferences.

The basic idea of the lecture is to evidence, both theoretically and on concrete examples, that to formally describe a new species (/subspecies /variety) was, and still is today, a relatively easy task, even with rather poor biological documentation. When later scholars study it with different approaches, it may happen that their new experimental systematic data do not support any concrete biological distinctiveness of the taxon. Despite this, it may be very difficult to definitely state that a species falls in synonymy (i.e. it is a heterotypic synonym) with another.

Although the analytical tools available in the last decades to taxonomists became more and more powerful, the subjectivity in defining *ranks* is still apparent, concerning not only the generic and suprageneric levels (a notoriously difficult task), but also the specific and infraspecific categories.

This should be kept in mind not only by taxonomists, but by all plant biologists in general. No solutions are at hand, but a single word is crucial for anyone managing species, either as scientific names or biological units: *awareness*.