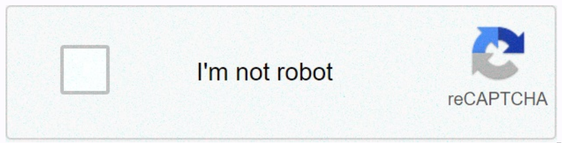
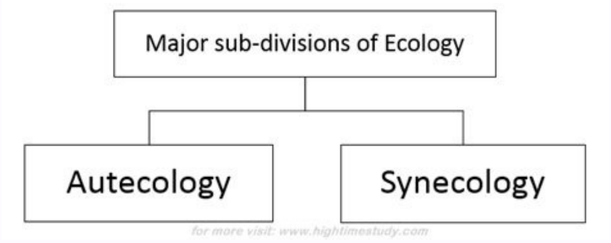


I'm not robot!

Difference between autecology and synecology pdf

Autecology is an approach in ecology that seeks to explain the distribution and abundance of species by studying interactions of individual organisms with their environments. An autecological approach differs from both ecosystem ecology, community ecology (synecology) and population ecology (demecology) by greater recognition of the species-specific adaptations of individual animals, plants or other organisms, and of environmental over density-dependent influences on species distributions.[1] Autecological theory relates the species-specific requirements and environmental tolerances of individuals to the geographic distribution of the species, with individuals tracking suitable conditions, having the capacity for migration at at least one stage in their life cycles.[2] Autecology has a strong grounding in evolutionary theory, including the theory of punctuated equilibrium and the recognition concept of species.[3][page needed] History Autecology was pioneered by German field botanists in the late 19th century.[4] During the 20th century, autecology continued to exist mainly as a descriptive science rather than one with supporting theory and the most notable proponents of an autecological approach, Herbert Andrewartha and Charles Birch, avoided the term autecology when referring to species-focused ecological investigation with emphasis on density-independent processes.



Part of the problem with deriving a theoretical structure for autecology is that individual species are unique in their life history and behaviour, making it difficult to draw broad generalisations across them without losing the crucial information that is gained by studying biology at a species level.[2] Progress has been made in more recent times with Paterson's recognition concept of species and the concept of habitat tracking by organisms.[5] The most recent attempt at deriving a theoretical structure for autecology was published in 2014 by ecologists Gimme Walter and Rob Hengeveld. Basic theory Recognition concept Autecological theory is focused on species as the most important unit of biological organisation, as individuals across all populations of a particular species share species-specific adaptations that influence their ecology.[2] This particularly relates to reproduction, as individuals of a sexual species share unique adaptations (e.g. courtship songs, pheromones) for recognising potential mates, and share a fertilisation mechanism that differs from those in all other species.
This recognition concept of species differs from the biological species concept (or isolation concept) which defines species by cross-mating sterility, which in allopatric speciation is merely a consequence of adaptive change in a new species' fertilisation mechanism to suit a different environment.[3][page needed] Environmental matching Individuals from across a species' range tend to be relatively uniform in terms of their dietary and habitat requirements and the range of environmental conditions they can tolerate. These differ from those of other species. Individuals of a species likewise share specific sensory adaptations for recognising suitable habitat. Seasonal changes and variability in climate mean that the spatial and/or temporal distribution of suitable habitat for a species also varies.[2] In response, organisms track suitable conditions, for example by migrating in order to remain within suitable habitat, for which there is evidence in the fossil record.[6] By determining the requirements and tolerances of a particular species, it is possible to predict how individuals of that species will respond to specific environmental changes [2] Population sizes and replacement level reproduction Autecological theory predicts that populations will reproduce at around replacement level unless a period of environmental change causing unusually high or low survival causes the population to grow or shrink before restabilising at replacement level again.[7] Population numbers may be reduced by introduction of new predation pressure, such as with poor fisheries management or introduction of a biological control agent to control an invasive species, such that net reproductive rate, R0, drops below replacement level.[2] The species being preyed upon in each case may stabilise at a lower population density where it is more difficult for individuals of the higher trophic level to locate the prey species, but at this point relieving predation tends to make little difference to population size, as individuals continue to reproduce around replacement level as they were at a higher density prior to the introduction of a higher trophic level.[8] Applications Pest management Pest includes animals or agents that cause economic damage to cultivated crops. Pest manage refers to the techniques and methods applied to control or minimize the damage to the crops done by pest. Pest management may include chemical, mechanical, biological or integrated approach. To apply any type of effective management programme, it is of utmost importance to know in details about the particular pest species. Spcially study of the ecology of the pest provide necessary clues to its management. Biological control This section is empty. You can help by adding to it. (February 2018) Conservation autecology Knowledge of species-level interactions, tolerances and habitat requirements is valuable for conservation of an endangered plant or animal species by ensuring its particular ecological requirements are met.[9][10] Links to other fields With focus on individual organism, autecology has mechanistic links to several other biological fields, including ethology, evolution, genetics and physiology[2] References ^ Walter, GH; Hengeveld, R (2000). "The Structure of the two ecological paradigms". Acta Biotheoretica. 48: 15–36. ^ a b c d e f g Walter, GH; Hengeveld, R (2014). Autecology: organisms, interactions and environmental dynamics. Boca Raton: CRC Press. ^ a b Paterson, HEH (1993). Evolution and the recognition concept of species.

Leaf	Number of stomata	
	Upper epidermis	Lower epidermis
A	300	0
B	150	200
C	02	13

Baltimore: Johns Hopkins University Press. ^ Cittadino E. 1990. Nature as the Laboratory. Darwinian Plant Ecology in the German Empire, 1880-1900. Cambridge: Cambridge University Press. ^ Hengeveld R. 1985. Dynamics of Dutch beetle species during the twentieth century (Coleoptera, Carabidae).
Journal of Biogeography 12: 389-411. ^ Turner A and Paterson H (1991) Species and speciation: evolutionary tempo and mode in the fossil record reconsidered. Geobios 24:761-769. ^ Robin J-P, Denis V. 1999. Squid stock fluctuations and water temperature: temporal analysis of English Channel Loliginidae. Journal of Applied Ecology 36: 101-110. ^ Walter GH (2003) Insect Pest Management and Ecological Research Cambridge University Press, Cambridge, UK. ^ Gonzalez-Benito E, Martin C and Iriondo JM (1995) Autecology and conservation of Erodium paularense Fdez. Glez. & Izco. Biological Conservation 72: 55-60. ^ Stewart AJA and New TR (2007) Insect conservation in temperate biomes: issues, progress and prospects. In Stewart A J A, New TR and Lewis OT (eds.) Insect Conservation Biology, CABI, Wallingford, UK. Retrieved from " The term ecology was coined by Ernest Haeckel. “Ecology”, the term was derived from two Greek words-‘oikos’ meaning house and ‘logos’ meaning study. E.P.Odum, the famous ecologist defined ecology as ‘the study of structure and function of nature’. In simple terms, ecology is the branch of biology that deals with the scientific study of the interactions among organisms and their environment.The branch Ecology is further divided into Autecology, Synecology and Habitat ecology.Refer figure for better understandingIt is the study of individual organism or individual species or a population in relation to their environmentIt is the study of group of organisms or many species or communities in relation to their environmentIt is also called as population ecologyIt is also called as community ecologyThe study is at the level of an individual, a population or an entire speciesSynecology is concerned with study of the highest level of biological organization; many populations in an area (called as community) interacting with each other and also with the environment. It can even be the study of an ecosystemAutecology is comparatively simple experimental and inductive.Synecology is complex, philosophical and deductive. (Refer: Inductive vs Deductive)Autecology studies can be accommodated in a laboratory setup and data is interpreted using conventional mathematical tools**Synecology studies refers to the interaction of a whole system and that cannot be accommodated in a laboratory setup as the system is naturally formed after interactions of hundreds of years such as a forest ecosystemExample: Study of Zebra population in relation to its environment (may be factors like rainfall, hunting, lion population etc in a grassland ecosystem) see the figure (in dotted black lines)Example: Study of entire grassland ecosystem(including all the species or communities) see the figure (in green thick border)

Synecology	Autecology
Holistic	Reductionistic
Ecology of relationships among the various organisms and populations	Ecology of individual organisms and populations
Mostly concerned with communication of material, energy and information among system components	Mostly concerned with the elements themselves