Scorpion ecologists sometimes like to characterize scorpions as to their general habitat and requisite morphological modifications. Polis (1990) lists four ecomorphotypes and discusses the morphological adaptations assigned to each. However, I think that only two primary ecomorphotypes need to be recognized. These are the obligate burrowers (fossorial scorpions) and the crevice dwellers (errant scorpions). Polis' other two ecomorphotypes are easily interpreted as special cases of these two primary types.

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FOSSORIAL ("burrowing")

· S Fossorial scorpions spend almost their entire existence in a burrow of their own construction. At night, they may venture out of their burrow to capture prey, move soil from the tunnel, disperse (especially juveniles), or search for a mate. Females are generally completely sedentary. Only the males leave their home burrow to search for mates. These males must find their way back to their burrow, use another scorpion's burrow, or construct a new burrow every night. They will often dig shallow burrows under any available shelter, e.g., rocks, logs, sleeping tourists, and the like. It is very difficult to characterize these scorpions as to morpholoical adaptations because there are so many different types from different taxonomic families. Polis (1990) lists several characteristics that he attributes to fossorial scorpions. However, I find that these are over-generalizations that owe as much to phylogenetic affinity as they to to digging behavior.

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PSAMMOPHILOUS ("sand-loving")

· S Polis (1990) considers this category to be one of the three most important ecomorphotypes, but as far as I'm concerned, psammophilous scorpions are simply fossorial scorpions that are specially adapted for burrowing into loose sand. Many psammophilous species have fossorial relatives. Furthermore, many species considered fossorial have psammophilous adaptations (all paruroctonines, for instance, have setal combs on the tarsi regardless of whether they live

in packed or loose soils). Psammophilous species often have elongated tarsal claws and setal combs on their legs. They are usually more streamlined (in relative sense) than their normal fossorial relatives, and tend to be the color of the sand they live in.

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ERRANT ("wandering")

· S Polis (1990) considers this group to include those species that actively move during foraging and states that it is not as universal as the other categories. But if you are to include all species that actively move about during foraging, then this category is large and universal indeed. I consider errant scorpions to be those that routinely use only pre-existing objects for their retreats, perhaps cleaning and enlarging the shelter. Scorpions in this category may be crevice-dwelling generalists, e.g., bark scorpions like Centruroides ssp., which will use any kind of crevice for a retreat, or they may prefer only certain types of crevices. Some species are capable of burrowing, e.g.,
Liocheles australasiae
, but are normally found in crevice environments. These I would term facultative burrowers. Morphological adaptations in this group do not follow any strict rules and seem to be affected by size and geneology. Larger crevice-dwelling scorpions like some ischnurids and euscorpiids exhibit marked dorso-ventral flattening of the body and lateral flattening of the metasoma, which may be very short. On the other hand, large buthids, e.g., some species of Centruroides, may be very slender with long metasomas and are not particularly flattened. Most errant scorpions appear to be generalists. They may be found under a rock on one ocassion, under the loose bark of a tree on another, inside of a rotten log on another, or even on the walls of a human dwelling. It is more difficult to identify crevice dwelling specialists because the habits of most species are not well known.

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LITHOPHILOUS ("rock-loving")

· S Polis (1990) uses this term to describe all scorpions that appear to live in or among crevices in rocks. I prefer to restrict the term to those scorpions that live specifically in weathering cracks

in rocks and cliff faces. Hadogenes is the best example of a truly lithophilic scorpion. They are seldom found away from the rocks that provide them with shelter.

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INTERLAPIDICOLOUS ("between rocks")

· S These species live in stone rubble, moving about between the rocks. These species may also be found under surface stones and on hard soil that provides ample crevices. Serradigit us is a good example of an interlapidicolous species.