

SPECIES EVOLUTION AND RELATIONSHIPS

The six species recognized here represent six morphologically distinguishable samples; of these, *crassicornis* is distinct in a number of good characters from the other five samples, and there is every reason to maintain it as a good species. Its range in southern Brazil and northern Argentina, so far as the present incomplete collections show, is separated by the bulk of the South American continent, or over 3,000 miles, from the nearest known locality of any of the other species. In Panama, we find two sympatric species, *zeteki* and *metopia*, which are very different from one another (Figs. 1 and 2). In *zeteki*, the head is long and exceedingly flattened, and the mandibles are fairly long, with many denticles, while *metopia* has a deep, short, broad head and very short mandibles. So far, our knowledge of the distribution of both of these species is limited to knowing that they both have been taken on Barro Colorado Island in the Canal Zone.

Two of the remaining three species (*brevicornis* and *mustelina*) are very similar to one another and to *zeteki*, and *mustelina* also approaches *metopia*. In fact, these four species can be arranged as the morphocline *zeteki* \longrightarrow *brevicornis* \longrightarrow *mustelina* \longrightarrow *metopia*. In their distribution, however, *zeteki* and *metopia* occur together in Panama, *brevicornis* is in Costa Rica and Honduras (and presumably also in between, in Nicaragua), and *mustelina* is widespread in tropical Mexico. Thus we see that the morphocline is partly also a geographical cline running from Panama to Mexico: *zeteki* \longrightarrow *brevicornis* \longrightarrow *mustelina*. This situation suggests that *zeteki*, *brevicornis* and *mustelina* could amount to one clinally varying species occupying much of Central America and tropical Mexico, and that the *zeteki* population may represent extreme character displacement in the presence of *metopia*, which is itself displaced toward the other extreme. An alternative possibility should not yet be excluded: *metopia* could belong with *brevicornis* and *mustelina*, and could represent a reversal of cline where *zeteki* is present and displaces it. Despite the interest of this possible character displacement situation (see Brown and Wilson, 1956, Syst. Zool., 5: 49-64), we unfortunately lack the material needed to confirm it at the present time. We have no samples from Guatemala