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# Phylogeny and taxonomy of the Middle Eastern geckos of the genus *Cyrtopodion* and their selected relatives

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## Abstract

Representatives of the gekkonid genus *Cyrtopodion* and related genera form a highly diversified group of Palearctic geckos, whose taxonomy is still unstable and phylogeny little known. This study tries to improve this situation by attempting to reconstruct the phylogeny based on two molecular markers (partial sequences of mitochondrial cytochrome *b* and 12S rRNA genes) in the Middle Eastern species of the genus *Cyrtopodion* and members of the genera *Agamura* and *Bunopus*. The results support the monophyly of the species groups within the genus *Cyrtopodion* as defined by Anderson (1999), but relationships between these groups remain largely unresolved. The *kotschyi* group (= subgenus *Mediodactylus*) is not closely related to the rest of the genus *Cyrtopodion* and should be treated as an autonomous genus. *Agamura persica* forms a monophyletic group with *agamuroides* + *caspium* + *scabrum* species groups. The genus *Bunopus* does not seem to be closely related to this clade. We briefly discuss the implications of our findings and stress the importance of further molecular studies in Palearctic geckos.

**Key words:** *Agamura*, angular-toed, *Bunopus*, lizards, mtDNA

## Introduction

The representatives of the gekkonid genus *Cyrtopodion* form one of the most diversified groups of Palearctic geckos (Szczerbak & Golubev 1986). The majority of the species inhabits arid regions from the eastern Mediterranean, through the Middle East and south-west Asia to northern India and the slopes of the Himalayas. Their northern range reaches Central Asia. Geckos of the genus *Cyrtopodion* are found on a variety of substrates in diverse environments including rocks, trees and sandy, loess or stone biotopes, with some species living even in synantropy. Individual species differ not only in ecology, but also in external morphology, especially in body size and shape. Ecological and morphological diversity of Palearctic geckos, together with their high abundance in many regions makes this group an interesting model for research in such fields as ecomorphology or evolutionary ecology. However, progress in these fields and the interpretations of evolutionary scenarios are prevented by unknown phylogeny and taxonomy of the group.

The history of the delimitation of the genus *Cyrtopodion* and its unstable systematics includes many competing views and mirrors complex relationships among taxa involved. Briefly, the species of the genus were assigned to the cosmopolitan genus *Gymnodactylus* (e.g. Annandale 1906; Smith 1935) in the past. Underwood (1954) split the genus *Gymnodactylus*, and incorporated most of its Old World species into the genus *Cyrtodactylus*. His classification was not universally accepted and some European researchers still understood

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