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CHAPTER 4

PHYLOGENY, BIODIVERSITY, AND SPECIES LIMITS OF PASSERINE BIRDS IN THE SINO-HIMALAYAN REGION—A CRITICAL REVIEW*

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Abstract.—We analyzed passerine biodiversity and phylogeography in the Sino-Himalayan region with respect to neighboring areas, especially the Siberian taiga zone to the north and tropical Asia southeast of the Himalayas and mountainous parts of southwest China. Fresh results, informative about evolutionary processes in that area, were obtained mainly by the application of new methods in passerine systematics, acoustic and molecular genetic markers. It became evident that species with areas in the Himalayas and southwest China and, in addition, often with disjunct areas in Siberia, actually belong to swarms of closely related, mostly allopatric species. In many cases these differ markedly in vocalizations and are deeply split according to molecular genetic markers. External morphology of the constituent taxa quite often remained surprisingly homogeneous and thus resulted in traditional subspecies status of single populations at best. Other such well-differentiated taxa were often overlooked and only discovered by molecular genetic techniques. Within the Himalayas, contrary to current thinking, intra-range differentiation is well developed in some taxa but still largely unresolved because of deficient sampling along the Himalayan chain. Both subspecies and allopatric species are also concerned here. Apparently, the Himalayas were mostly settled from the east following intra-range diversification. Immigration from the west into the Himalayas was a much rarer event and, impeded by the monsoons, immigrants reached just west Nepal and, with respect to evolutionary history, did not diverge further. Himalayan endemic passerines are few and mainly confined to the western part.

Key words: acoustics, China, Himalayas, molecular genetics, Siberia, Sino-Himalayan region, speciation.

Filogenia, Biodiversidad y Límites de las Especies de Aves Paserinas en la Región Sino-Himalaya—Una Revisión Crítica

Resumen.—Analizamos la biodiversidad y filogenia de paserinos en la región Sino-Himalaya con relación a las áreas vecinas, especialmente la zona de la taiga siberiana hacia el norte y Asia tropical al sudeste del Himalaya, y las partes montañosas del sudoeste de China. Nuevos resultados, que brindan información sobre los procesos evolutivos en aquellas áreas, fueron obtenidos principalmente por la aplicación de nuevos métodos en sistemática de paserinos, acústica y marcadores genéticos moleculares. Se hizo evidente que las especies distribuidas en el Himalaya y el sudoeste de China, que además usualmente se encuentran en áreas disyuntas en Siberia, pertenecen en realidad a enjambres de especies mayormente alopátricas y cercanamente emparentadas. En muchos casos éstas difieren marcadamente en vocalizaciones y están profundamente escindidas

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