

LATE PLEISTOCENE PASSERINES FROM SOUTH AMERICAN SEMI-ARID SCRUB HABITATS

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INTRODUCTION

Fossil birds are exceptionally rare in northern South America. There are three late Pleistocene-age fossil sites where they have been recovered, La Carolina, Ecuador, and the tar seeps at Talara, Peru, and Inciarte, Venezuela. The vertebrate fauna, especially the megamammals, identified from these semi-arid fossil sites show that during the late Pleistocene they all sustained more diverse and complex communities compared to today. Evidence of wetter conditions in the Pleistocene in the past perhaps due to different precipitation regimes or runoff from adjacent rivers or mountains than what is found at the present at the fossil sites is seen in the number of aquatic to semiaquatic bird orders identified from these sites. These include: Anseriformes, Podicipediformes, Ciconiiformes, and Charadriiformes (Campbell 1976, 1979). This paper will be the first report of the passerines from Talara, Peru and Mene de Inciarte, Venezuela and the paleoecology that these fossils indicate at these sites. Passerines and small vertebrate fossils, although difficult to find and identify, are bioindicators and they can determine fine scale differences in vegetation or climate at fossil sites in the past.

THE TAR SEEPS

LA CAROLINA, ECUADOR AND TALARA, PERU

La Carolina and Talara have similar semi-arid climates today and they both likely had similar climates in the late Pleistocene. The Pleistocene-age fossil birds recovered from these sites that are separated by 275 km were very similar and had 72% of the species in common with each other (Campbell 1976). Eighty-nine species of non-passerines have been identified from the fossils from Talara, Peru and 53 from La Carolina (Campbell 1976). The Talara tar seeps have been ¹⁴C dated to be 13,900 BP (Churcher 1966), approximately 2,500 years before the end of the last glacial period (Campbell 1979). Based on the overall similarity of the vertebrate faunas identified from both La Carolina and Talara, including extinct species, they are assumed to be approximately of the same age (Campbell 1976). The non-passerine birds, invertebrate fossils, and vegetative material collected from the tar seeps indicate a source of water near the sites or higher levels of precipitation at these sites in the late Pleistocene. The large vertebrates all typical of late Pleistocene mammal faunas identified from these fossil sites indicate grasslands, savannas, and possibly forests near the sites in the past (Churcher 1959, Lemon and Churcher 1961, Churcher 1966, Campbell 1976, Campbell 1979). All of these habitats are not found at these sites today. Presently, the area around the Talara is composed of arid scrub and 100 km south and 50 km west of present day tropical dry forest habitats. La Carolina is found on the Santa Elena Peninsula of Ecuador where conditions today are very arid.

INCIARTE, VENEZUELA

The Inciarte tar pits are found at the foothills of the Sierra de Perijá in Zulia, Venezuela and today the site is semi-arid with scrub vegetation. The three species of *Glyptodon* (*G. clavipes*, *G. holmesina*, and *G. occidentalis*) identified from these tar seeps have been ¹⁴C dated and are between 42,600 to 25,500 yr BP old (Jull et al. 2004); indicating that this site is at least late Pleistocene in age. A number of typical late Pleistocene mammals have also been identified from this site. All indicate savannas and wooded areas around the fossil site during the Pleistocene.

PASSERINE FOSSILS

Passeriformes make up >50% of the world's living species of birds, yet have received little attention in avian paleontology. Because most passerine bones are small, retrieving them from sediments requires labor-intensive screen-washing. Even when passerine fossils are recovered, the comparative osteology of

songbirds is challenging because characters to distinguish among species (or even genera and families in some cases) can be difficult if not impossible to discern. Nevertheless, with careful work under a dissecting microscope, diagnostic features can be found, especially in the rostrum (premaxilla), mandible, quadrate, and to a lesser degree in major post-cranial elements such as the coracoid, humerus, ulna, carpometacarpus, femur, tibiotarsus, and tarsometatarsus (Steadman 1981, Steadman and McKittrick 1982, Emslie 2007). Although difficult to find and identify, passerines and small vertebrates are bioindicators and they can indicate fine scale differences in vegetation or climate at fossil sites in the past.

FOSSIL PASSERINES-RESULTS

We have identified many common passerine species (Table 1) that are still found at Talara today, including *Mimus longicaudatus*, *Sturnella bellicosa*, many swallows and martins, and the endemic species, *Geositta peruviana* and *Sicalis taczanowskii*. We have also identified multiple individuals of *Gymnomystax mexicanus*, which is a blackbird (Icteridae) that prefers riverine, grassland habitats in eastern, lowland Peru, Columbia, Brazil, and drier habitats in Venezuela, and *Amblycerus holosericeus* another blackbird that is found approximately 170 km north in semideciduous forests in Tumbes today. These species, which are no longer found near Talara, indicate wetter conditions or at least different plant communities at the fossil site during the late Pleistocene perhaps due to melt water draining from the near by Andes Mountains (Churcher 1966) or from different precipitation patterns. This is a work in progress and we have approximately 2,000 more passerine fossils from this site to identify.

The passerines identified from the Mene de Inciarte site are all commonly found there today, except for *Quiscalus lugubris*. This species is found east of Inciarte in Venezuela, and it is a very common bird throughout the Caribbean Islands. There are 16 fossils from this tar seep that we still have to identify, including four suboscines and eight oscines.

Table 1. Preliminary results of the passerines identified from Talara, Peru.

Taxa	Common name	Number of elements
<i>Geositta peruviana</i>	Peruvian Miner	1
<i>Sayornis bairdi</i>	Collared Antshrike	4
<i>Progne tapera</i>	Brown-chested Martin	2
<i>Progne chalybea</i>	Gray-breasted Martin	1
<i>Tachycineta stolzmanni</i>	Tumbes Swallow	6
<i>Petrochelidon rufocollaris</i>	Chestnut-collared Swallow	25
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	1
<i>Hirundo rustica</i>	Barn Swallow	1
<i>Mimus longicaudatus</i>	Long-tailed Mockingbird	17
<i>Arremonops</i> sp.	---	2
<i>Aimnophila</i> sp.	---	2
<i>Sicalis</i> sp.	---	57
<i>Sporophila</i> sp.	---	1
<i>Cacicus holosericus</i>	Yellow-billed Cacique	1
<i>Molothrus bonariensis</i>	Shiny Cowbird	3
<i>Dives warszewiczi</i>	Scrub Blackbird	2
<i>Gymnomystax mexicanus</i>	Oriole Blackbird	5
<i>Sturnella bellicosa</i>	Peruvian Meadowlark	106

Table 2. Preliminary results of the passerines from Mene de Inciarte, Zulia Province, Venezuela.

Taxa	Common Name	Number of elements
<i>Furnarius longirostris</i>	Pale-legged Hornero	2
<i>Pyrocephalus rubinus</i>	Vermillion Flycatcher	1
<i>Tyrannus melancholicus</i>	Tropical Kingbird	1
suboscines	---	4
<i>Hirundo rustica</i>	Barn Swallow	1
<i>Vireo olivaceus</i>	Red-eyed Vireo	2
<i>Hylophilus flavipes</i>	Scrub Greenlet	1
Parulidae	Large warbler	2
<i>Tangara cayana</i>	Burnished-buff Tanager	1
Thraupidae / Emberizidae / Cardinalidae	Tanager / Sparrow / Cardinal	4
<i>Quiscalus lugubris</i>	Carib Grackle	3
<i>Sturnella militaris</i>	Red-breasted Blackbird	1
oscines	---	8

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