

EOCENE AND MIOCENE FRUITS AND SEEDS REVEAL THE EVOLUTION OF ANCIENT PANAMANIAN FORESTS

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CUCARACHA FLORA - MIDDLE MIOCENE FLOURISHING RAINFOREST

FOSSILS FROM MIDDLE MIOCENE CUCARACHA FORMATION FROM THE PANAMA CANAL PROVIDE A UNIQUE OPPORTUNITY TO EXPLORE ANCIENT BIOMES THAT LIVED UNDER TWO VERY DIFFERENT CONDITIONS THAN MODERN-DAY FORESTS IN THE REGION: THE PHYSICAL SEPARATION OF PANAMA FROM SOUTH AMERICA & THE MID-MIOCENE CLIMATIC OPTIMUM. NEW ~17-19.5 MA OLD FOSSILS OF EXQUISITELY PRESERVED PERMINERALIZED FRUITS & SEEDS SHOW A FLORISTIC COMPOSITION TYPICAL OF LIVING LOWLAND NEOTROPICAL RAINFORESTS. SOME OF THE NEWLY RECOGNIZED FAMILIES & GENERA INCLUDE SACOGLOTTIS, PARINARI, CISSUS, ANNONACEAE, ANACARDIACEAE, LAURACEAE, ARECACEAE, & PASSIFLORACEAE.

THE FOSSIL FLORA SUGGEST A WARM AND WET CLIMATE DURING THE MIDDLE MIOCENE IN PANAMA, CONTRARY TO PREVIOUS PALEOCLIMATIC ESTIMATES BASED ON PALEOSOLS WHICH SUGGESTED VERY DRY AND COOL CONDITIONS.

THE PRESENCE OF PLANT GENERA IN PANAMA THAT HAVE ALSO BEEN RECORDED IN NORTHERN SOUTH AMERICA PRIOR TO THE CLOSING OF THE SEAWAY IMPLY THAT LONG DISTANCE DISPERSAL EVENTS WERE MORE COMMON IN NEOTROPICAL RAINFORESTS THAN THOUGHT.



PANAMANIAN PENINSULA MIDDLE MIOCENE

TONOSI FLORA - LATE EOCENE COLONIZING NEW LAND

CENTRAL AMERICAN RAINFORESTS ARE AMONG THE MOST DIVERSE BIOMES IN THE WORLD TODAY. HOWEVER, WE KNOW LITTLE ABOUT THEIR HISTORY BECAUSE OF A POOR FOSSIL RECORD. HERE, WE REPORT THE ONLY MACROFOSSIL RECORD FOR THE EOCENE IN CENTRAL AMERICA & TROPICAL SOUTH AMERICA SO FAR. THE FOSSILS COME FROM A PACIFIC SITE NEAR TONOSI IN CENTRAL PANAMA.

THIS STUDY PRESENTS NEW EIGHT SPECIES OF ENDOCARPS & SEEDS. AFFINITIES AT THE FAMILY/ORDER LEVEL INCLUDE: ARECACEAE, VITACEAE, HUMIRIACEAE, ANACARDIACEAE, & LAMIALES. BIOGEOGRAPHICALLY, TWO OF THE TONOSI TAXA, DRACONTOMELON & LEEA, ARE INTERESTING BECAUSE THEY OCCUR TODAY ONLY IN LOWLAND RAINFORESTS OF AFRICA & AUSTRALASIA. LACUNOCARPA IS THE OLDEST RECORD FOR HUMIRIACEAE & SUPPORTS A NEOTROPICAL ORIGIN FOR THIS FAMILY.

WE INTERPRET THE FRUIT MACROFLORA FROM TONOSI AS A RECORD OF THE COLONIZING VEGETATION IN THE EMERGENT EOCENE VOLCANIC ARCH OF SOUTHERN CENTRAL AMERICA



TONOSI ISLAND LATE EOCENE

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