

Experimental evaluation of the viability in the *Juniperus deppeana* forest seed dispersal by endozoochory and diploendozoochory after wild zoo mammals' ingestion.

Fabián Rubalcava-Castillo¹, Arturo Valdivia-Flores¹, José Luna-Ruiz¹, Luis Íñiguez-Dávalos², Víctor Martínez-Calderón¹, Antonio Meraz-Jiménez¹, and Joaquín Sosa Ramírez¹

¹Universidad Autónoma de Aguascalientes

²Universidad de Guadalajara Centro Universitario de la Costa Sur

January 14, 2023

Abstract

Carnivores participate in forest disturbance recovery by dispersing the seeds that pass through their digestive systems. The objective of this study was to evaluate the capacity of mammals for *Juniperus deppeana* seed dispersal with an experimental evaluation of endozoochory and diploendozoochory, through indices of recovery, viability, changes in testas, and retention of seeds in the digestive tract. *Juniperus deppeana* fruits were collected in the Sierra Fría Natural Protected Area, Aguascalientes, Mexico, and were administered in the diet of gray fox (*Urocyon cinereoargenteus*), coati (*Nasua narica*) and domestic rabbits (*Oryctolagus cuniculus*) these three mammals represented the endozoochory. For the diploendozoochory, seeds excreted by rabbits were incorporated into the diets of bobcat (*Lynx rufus*) and cougar (*Puma concolor*) in a local zoo. The seeds present in the scats were collected, and recovery rates and retention times were estimated; viability was estimated by X-ray optical densitometry, and testa thicknesses and surfaces were checked by scanning electron microscopy. The results showed a recovery of seeds greater than 70% in all the animals; the retention time was < 24 h in the endozoochory, but the time was longer (24-96 h) in the diploendozoochory ($P < 0.05$). Seed viability ($\bar{x} \pm SD$) was decreased in rabbits ($74.0 \pm 11.5\%$) compared to fruits obtained directly from the canopy ($89.7 \pm 2.0\%$), while gray fox, coati, bobcat and puma did not affect viability ($P < 0.05$). An increase in the thickness of the testas was also observed in seeds excreted from all mammals ($P < 0.05$). Through evaluation, our results suggest that mammalian endozoochory and diploendozoochory contribute to dispersal of *J. deppeana* by maintaining viable seeds with adaptive characteristics in the testa to promote resilience and forest restoration. In particular, felines (predators) can provide an ecosystem service through scarification and seed dispersal.

Hosted file

Experimental evaluation of endozoochory-diploendozoochory.docx available at <https://authorea.com/users/363980/articles/619062-experimental-evaluation-of-the-viability-in-the-juniperus-deppeana-forest-seed-dispersal-by-endozoochory-and-diploendozoochory-after-wild-zoo-mammals-ingestion>



