

## 89th Annual Meeting of the American Association of Physical Anthropologists

### Virtual Meeting

#### **Bornean orangutan (*Pongo pygmaeus wurmbii*) patterns of frugivory and the relation to seed dispersal and seed predation**

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Seed dispersal is important for forest growth, maintenance, and regeneration. Orangutans are large-bodied frugivores with ecological roles as seed predators and seed dispersers. However, little is known about orangutans' ecological roles and how they relate to orangutans' patterns of frugivory. We investigated Bornean orangutans' (*Pongo pygmaeus wurmbii*) ecological roles at the Cabang Panti Research Station in Gunung Palung National Park, Indonesian Borneo. We collected orangutan feces (n=401) and analyzed them for intact seeds (August 2018 to March 2020). We observed orangutan fruit handling behavior for 306 feeding bouts for 53 fruit genera to measure how often orangutans swallow, spit, or predate seeds. We used Ivlev's Electivity Index to analyze fruit preference using long-term feeding data and phenology data (2014-2019). Lastly, we combined fruit preference with fruit handling behavior using the seed dispersal effectiveness framework to identify which fruit taxa were most effectively dispersed. Orangutans dispersed seeds in 71.8% of fecal samples with a mean of  $27.9 \pm 4.5$  (SD=0.95) seeds (>2mm) per fecal sample. Orangutans predated seeds more often than spitting or swallowing seeds (predating= 42.1% of fruit feeding time; spitting= 21.8%; swallowing= 12.5%; mixed behaviors= 10.6%, not observed=12.0%). Additionally, the top five preferred fruit genera, (*Dialium*, *Sindora*, *Scaphium*, *Magnifera*, and *Spatholobus*) were highly predated (0 to 5% of seeds dispersed). We identified *Alangium* and *Tetramerista* as the most effectively dispersed genera, orangutans frequently dispersed and preferred these fruits. We found orangutans are frequent seed predators, but this overlaps with their seed dispersal role, and we describe orangutans' seed dispersal contribution.

Funders: NSF (9414388, BCS-1638823, BCS-0936199); National Geographic; USFish/Wildlife (F18AP00898, F15AP00812, F13AP00920, 96200-0-G249, 96200-9-G110); Leakey; Disney Conservation Fund; Wenner-Gren; Nacey-Maggioncalda; Conservation-Food-Health; Orangutan Conservancy; Woodland Park Zoo; Boston University GRAF

Blackburn A, Susanto TW, Knott CD. (2021). *Bornean orangutan (Pongo pygmaeus wurmbii) patterns of frugivory and the relation to seed dispersal and seed predation*. American Journal of Physical Anthropology 174, 11-11.