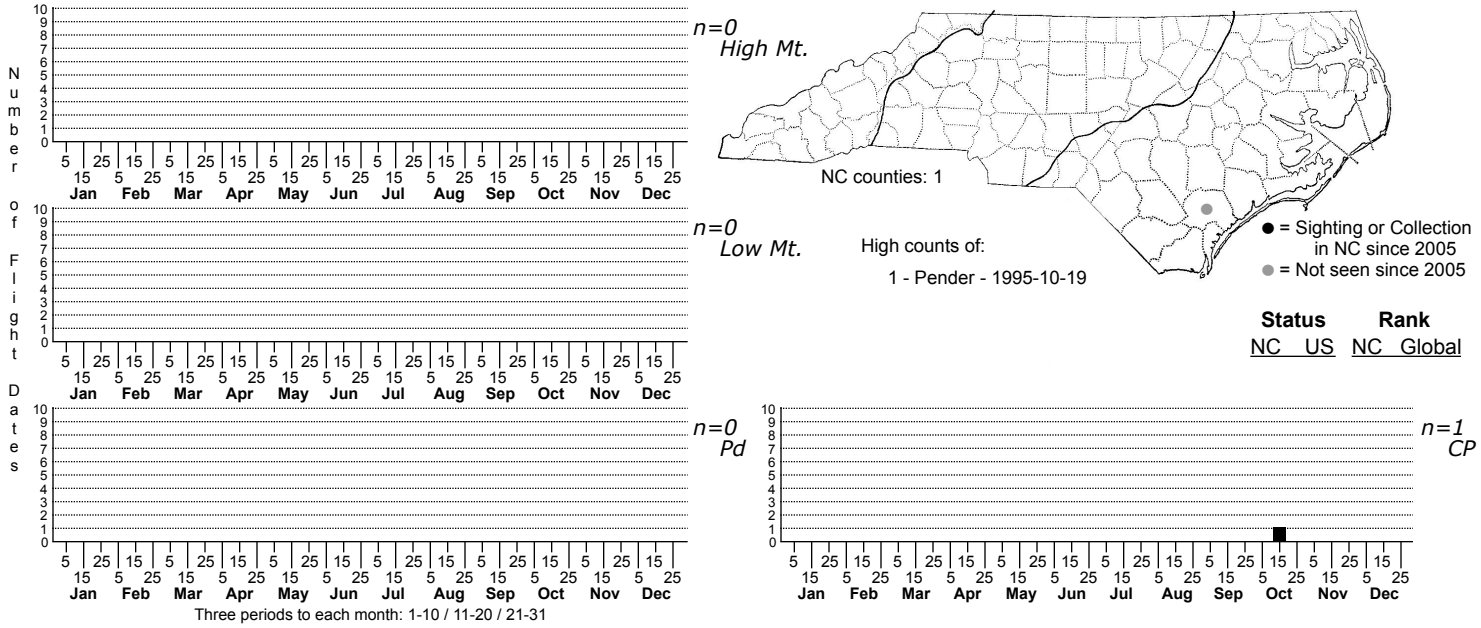
Papaipema eryngii Rattlesnake-master Borer Moth



FAMILY: Noctuidae SUBFAMILY: Noctuinae TRIBE: Apameini
TAXONOMIC_COMMENTS: One of 44 species in this genus that occur in North America north of Mexico (Lafontaine and Schmidt, 2010, 2015), 30 of which have been recorded in North Carolina

FIELD GUIDE DESCRIPTIONS:
ONLINE PHOTOS:
TECHNICAL DESCRIPTION, ADULTS: Bird (1917); Forbes (1954)
TECHNICAL DESCRIPTION, IMMATURE STAGES: Bird (1917)

ID COMMENTS: A medium-large Papaipema, with a dark reddish brown to chocolate ground color and prominent white basal, orbicular, claviform, and reniform spots. A pale yellow apical spot is also present and the hindwings are fuscous brown. Papaipema marginidens and birdi are similar -- both with white basal spots -- but are not as dark as eryngii and possess a brown spot within the orbicular that is usually absent in eryingi. The central lunule of the reniform is also yellow in birdi, cream in eryngii, and white in marginidens; in marginidens, the lunule extends through the two basal spots whereas it is completely contained within the spot ring in eryngii (Forbes, 1954).

DISTRIBUTION: Recorded at only a single site in the southern part of the Outer Coastal Plain. This is the only known population east of the Appalachians, with the next nearest located in central Kentucky.

FLIGHT COMMENT: Univoltine, with our one adult record obtained in October

HABITAT: Our sole record comes from a Longleaf Pine Savanna possessing a substantial population of Eryngium yuccifolium var. synchaetum. In the Outer Coastal Plain, populations of that plant -- as well as Eryngium aquaticum var. ravenelii and a number of other rare species -- usually indicate the presence of clay substrates derived from marl, a calcareous rock formation.

FOOD: Larvae are stenophagous, feeding on Rattlesnake-master (Eryngium yuccifolium) and Marsh Eryngo (E. aquaticum) (Bird, 1917; Hessel, 1954). In North Carolina, a larva was found in the rhizome of Southern Rattlesnake-master (Eryngium yuccifolium var. synchaetum), in the same patch of savanna habitat where an adult had previously been captured (J.B. Sullivan and E. Quinter, pers. obs.).

OBSERVATION_METHODS: Adults come to blacklights to some extent, but probably not to bait or flowers. The most efficient way to document the presence of a colony, however, is through searching for larvae by way of the frass they eject through a hole in the stem of their host plants. Given the extreme vulnerability of this species, we do not recommend that plants be dug up to confirm the presence of a larva.

NATURAL HERITAGE PROGRAM RANKS: G2 SH

STATE PROTECTION: A Candidate for federal listing and listed as Significantly Rare by the Natural Heritage Program. Neither of those designations, however, confers any legal protection, although permits are required to collect it on state parks and other public lands.

COMMENTS: Papaipema eryngii appears to be our rarest moth and of highest conservation concern; it may, in fact, already have been extirpated shortly after it was first discovered in the state. The species as a whole is believed to be globally threatened (Schweitzer et al., 2011) and has recently been formally designated as a Candidate for federal listing. It is scarce and declining even in the core area of its range in the tallgrass prairies of the Midwest, and the population discovered in North Carolina is the only one known from the entire Atlantic Slope. Both habitat conversion and alteration of the natural fire regime have been implicated in its decline. Bird (1917) noted that populations disappear from a site following a burn, and Panzer (cited by Schweitzer et al., 2011) found that populations recover from a fire only where unburned refugia exist, providing re-colonization sources. The Eryngium savanna in which our one population was found is maintained through prescribed burning, but most of it may be burned as a single unit. Only a single larva was found at the site by Sullivan and Quinter, who searched the area a year after the adult was captured. No evidence of larval feeding damage was observed in 2000 in a search conducted by S. Hall, nor in 2013 when a much more intensive search was conducted by Hall, Sullivan, and Anthony MacBride. While there is still some hope that a population survives somewhere in the vicinity, it appears likely that the species may no longer occurs where it was originally found.