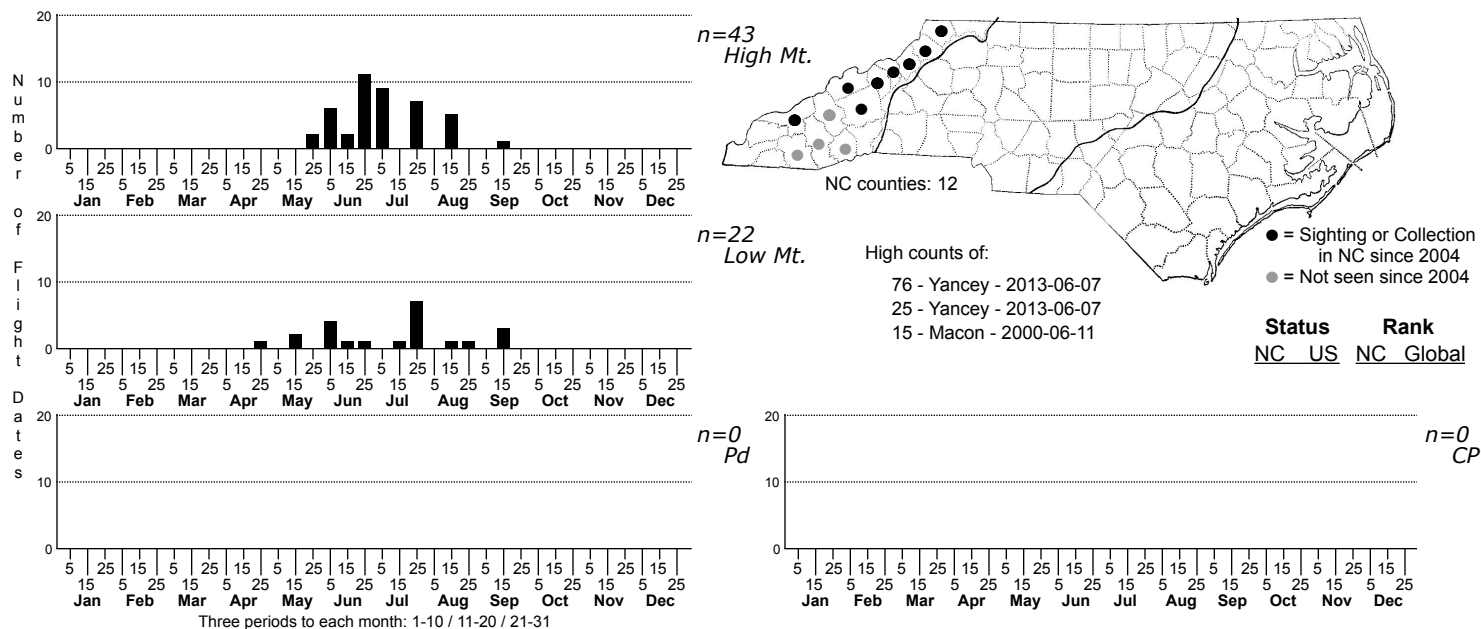


## *Macaria signaria* Pale-marked Angle



FAMILY: Geometridae SUBFAMILY: Ennominae TRIBE: Macariini

TAXONOMIC\_COMMENTS: This is one of 73 species in this genus that occur in North America, with 17 species occurring in North Carolina. In the latest checklist of North American Lepidoptera (Pohl and Nanz, 2023), North American members of the genus *Speranza* and *Epelis* were treated as junior synonyms of *Macaria*.

FIELD GUIDE DESCRIPTIONS: Covell (1984; as *Semiothisa signaria*); Beadle and Leckie (2012)

ONLINE PHOTOS:

TECHNICAL DESCRIPTION, ADULTS: Ferguson (2008)

TECHNICAL DESCRIPTION, IMMATURE STAGES: Maier et al., 2013

ID COMMENTS: Similar to other *Macaria* in their angled hindwings and sub-falcate forewings, but members of the *signaria* species group are distinguished from all other North Carolina *Macaria* in possessing a grayish rather than a yellowish head (Forbes, 1948). All members of this group are generally similar in their pattern of lines and spots. *Signaria* is most similar to *pinistrobata*, but the typical form has a more even shading of gray brown rather than the more black, gray, and white shading of *pinistrobata*; the pre-apical costal spot (upper end of the subterminal line) is reddish brown in *signaria*, particularly in the males, but strong, very dark blackish-brown (sometimes reddish) and quadrangular in *pinistrobata*. In form *fraserata* of *signaria*, however, these differences are less pronounced, with *fraserata* showing more contrast between the white ground color and possessing darker, blacker lines (Ferguson, 1974). *Fissinotata* is similar to typical *signaria* in being fairly lightly marked and grayish-brown but has a straight postmedian line, which is wavy in *signaria*; the medial line is also often weak or missing in *fissinotata* but usually present in *signaria*. *Granitata* is much more contrastingly marked than the other species and easily distinguished from the lightly and evenly marked form of *signaria* (see Ferguson, 1974, 2008, and Covell, 1984, for details).

DISTRIBUTION: All of our records come from the Mountains, but from the entire north-south range in the state.

FLIGHT COMMENT: Occurs throughout the growing season, but our data are not sufficient to determine if there are separate flights.

HABITAT: The majority of our records come from high elevation conifer forests, including from the summits of Mt. Mitchell, Grandfather Mountain, Roan Mountain, and Clingman's Dome. In those areas, all three of the main host plants are likely to be used. Records from lower elevations come primarily from coves and riparian areas, including Smokemont, Deep Creek, and Cataloochee in the Great Smokey Mountains National Park and New River State Park in Ashe County, all sites where Hemlocks are likely to be used. Carolina Hemlock also appears to be used, including on at least a few drier ridges, such as Bluff Mountain and several of the peaks around Highlands.

FOOD: Oligophagous, feeding a wide range of conifers. Ferguson (1974) lists Spruce, Fir, Hemlock as the most important hosts (Larch and Douglas Fir are also included but do not naturally occur in North Carolina); form *Fraserata* was believed to be associated with Fraser Fir. Ferguson also mentions that pines are used but that they may not be preferred, particularly in the East.

OBSERVATION\_METHODS: Comes well to 15 watt blacklights but we do not have any records from either bait or flowers.

NATURAL HERITAGE PROGRAM RANKS: G5 [S4]

STATE PROTECTION: Has no legal protection, although permits are required to collect it on state parks and other public lands.

COMMENTS: Two of the main host plants used by this species -- Fraser Fir and Eastern Hemlock -- are currently being decimated by exotic species of Adelgid. Form *fraserata* appears to have been particularly hard hit by loss of Fraser Fir forests (Ferguson, 2008). While Spruce is still fairly plentiful at high elevations, it may also become far more restricted due to the effects of global climate change. *Macaria signaria* is currently not being tracked by the Natural Heritage Program but we recommend that it be considered for inclusion on the Watch List and its status monitored along with other species associated with high elevation forests.