

restraint without undue resistance. I have used it successfully with a long series of *Citheronia regalis*, *C. sepulcralis* and *Eacles imperialis*. The photograph (Fig. 2) depicts one of those matings.

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NOTES ON *GRACILLARIA ELONGELLA* (GRACILLARIIDAE) WITH A DESCRIPTION OF THE LARVAL MOUTHPARTS

Since the hostplant records for *Gracillaria* (= *Gracilaria*) help form the basis for the taxonomy of the genus (Forbes, 1923, Cornell Univ. Agric. Expt. Sta., Mem. 68: 1-729) these records should be completely and precisely catalogued. Therefore, it is noteworthy that *Gracillaria elongella* (Linn.) has been reared from yellow birch, *Betula allegheniensis* (= *Betula lutea*) at the Hubbard Brook Experimental forest in Grafton Co., New Hampshire, because Forbes (loc. cit.) previously recorded alder as its only host.

The adult was needed for positive species identification so only the cast skin of the larva was used to draw the figures, instead of material preserved in alcohol. Forbes (1910, Ann. Entomol. Soc. Amer. 3: 94-125) stated that this method will produce satisfactory material for descriptions with the obvious advantage of associating a known adult with a larval skin. Four individuals were examined. All drawings were done under a compound microscope.

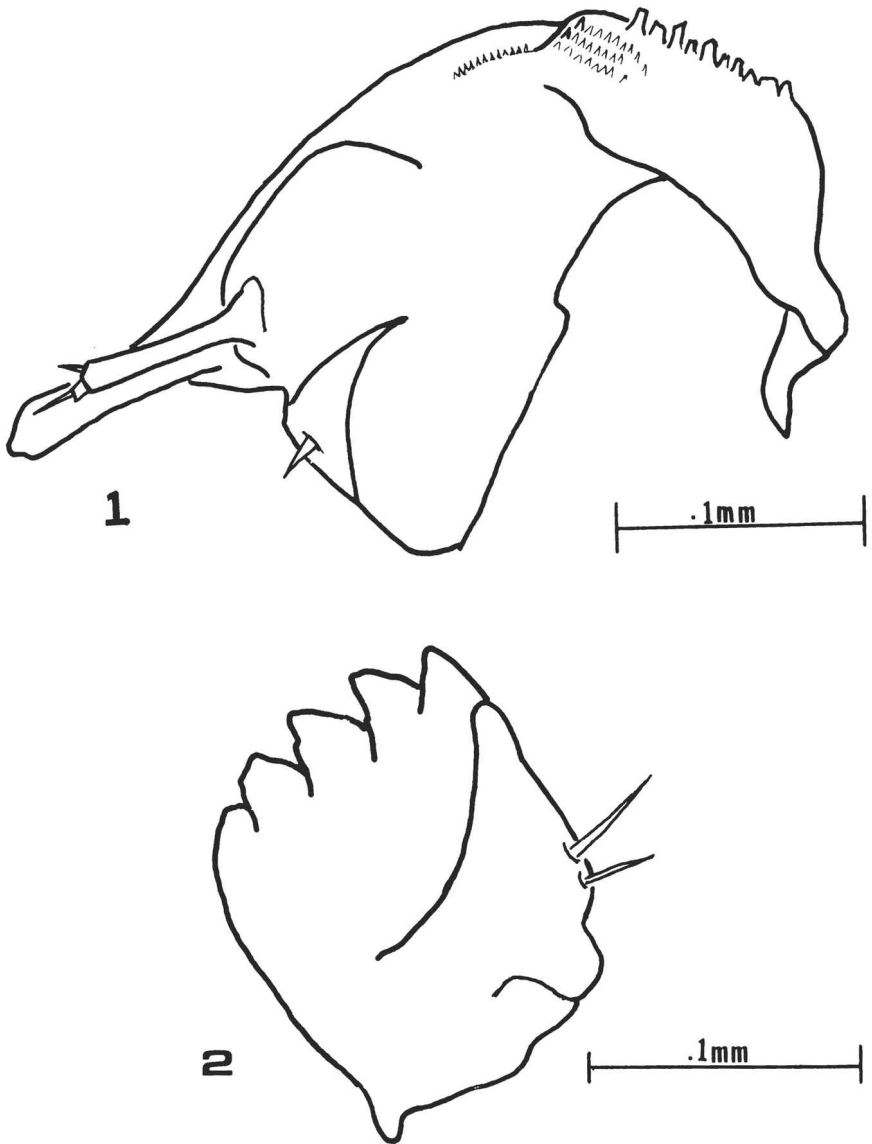
The hypopharyngeal complex is shown in Fig. 1 with terminology of Godfrey (1972, USDA Tech. Bull. No. 1450, 256 p.) and DeGryse (1915, Proc. Entomol. Soc. Wash. 17: 173-178). A pair of stipular setae are present. The proximomedial area bears a single row of ten stout blades flanked by smaller spines on either side. The distal spines cross the medial transverse cleft into the proximolateral region. The spinneret is blunt. DeGryse (loc. cit.) pictured an unidentified *Gracillaria* larva (from alder) which had a blunt spinneret and blades also. However, in contrast to *Gracillaria elongella*, that individual had the first three blades much reduced, not subequal (Fig. 1). Whether this represents intraspecific variation or another species is not known. MacKay's studies (1972 Can. Entomol. Mem. No. 88, 83 p.) on *Gracillaria syringella* showed a "broad spinneret, with silk pore dorsal at the apex."

The mandible (Fig. 2) has four sissorial teeth. The inner ridge bears an associated tooth also. A pair of lateral mandibular setae are present. The mandibles can provide useful specific characters in some cases (Forbes, 1910, loc. cit.), but they can change throughout the life of the larva (Embree, 1958, Can. Entomol. 40: 166-174; Fracker, 1915, Ill. Biol. Monogr. 2(1): 1-166). Dimmock (1880, Psyche 3: 99-103) stated that the mandible of *Gracillaria syringella* retained the same general form throughout larval life in contrast to the variability known in other species.

The chaetotaxy of the adfrontal area is shown in Fig. 3 with terminology after Hinton (1946, Trans. Roy. Entomol. Soc. Lond. 97: 1-37) who mentioned the position of the adfrontal (AF) setae as a useful specific character. Most *Gracillaria* have AF1 and AF2 well-separated (Forbes, 1910, loc. cit.), so *Gracillaria elongella* may be unusual in this respect, since it has the above two setae fairly close together. Unfortunately, the frontal setae group was damaged. The clypeal setae are subequal and arranged as shown.

The labrum is shown in Fig. 3 with nomenclature after Forbes (1923, loc. cit.). The chaetotaxy is shown on the left and the distribution of microspines on the right. L2 is slightly larger than L1 or L3. The medial group appears to have all setae subequal.

No information is available on the chaetotaxy of the thorax and abdomen although their size is definitely not minute, as stated by Fracker (1915, loc. cit.). MacKay (1972,



FIGS. 1-2. Larval mouthparts of *G. elongella*. 1, hypopharyngeal complex, lateral view; 2, mandible, ventral view.

Can. Entomol. Mem. No. 88, 83 p.) gives probable group characteristics based on *Gracillaria syringella*.

The addition of yellow birch as a host is not surprising. Stainton (1864, *Natural History of the Tineina*, London, 8: 72-75) cites Buxton as "noticing the larva on birch" in Europe, although all North American forms had been bred from alder, according to Forbes (1923, loc. cit.). Stainton (loc. cit.) described and pictured the superficial char-

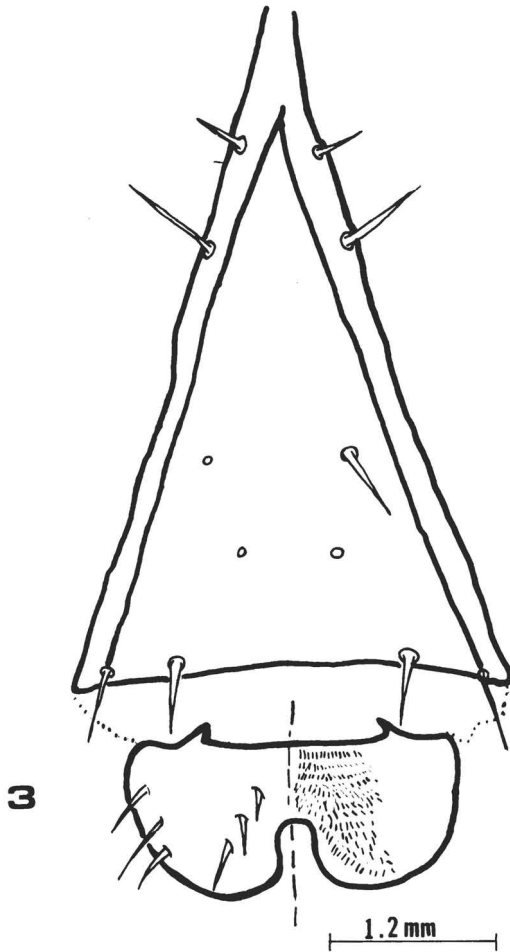


FIG. 3. Adfrontal area and labrum of *G. elongella*.

acteristics of the adult and larva. Pierce and Metcalfe (1935, *The Genitalia of the Tineid Families of the Lepidoptera of the British Islands*, F. N. Pierce, Oundle, Northants, 116 p.) illustrated the genitalia of both sexes.

The larva rolls a leaf in a cone-shaped fold. The pupa is usually spun near the leaf edge in an oval, transparent cocoon, and is protruded at emergence. The caterpillar may be collected in July and the moths emerge in August of the same year.

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