

A NEW SPECIES OF *PARACLEMENSIA* FROM EUROPE
WITH COMMENTS ON THE DISTRIBUTION
AND SPECIATION OF THE GENUS

[INCURVARIIDAE]

by Donald R. DAVIS

I recently received from Dr. Pierre VIETTE of the Museum National d'Histoire Naturelle two specimens of a species of *Paraclemensia* collected in southern France by Professor R. BUVAT. This material is particularly noteworthy as it is the first evidence of a genus previously thought to be restricted to the northeastern United States. Furthermore, the French specimens do not merely represent a new record for the European fauna ; they also represent a new species and only the second to be discovered for the previously monotypic genus *Paraclemensia*.

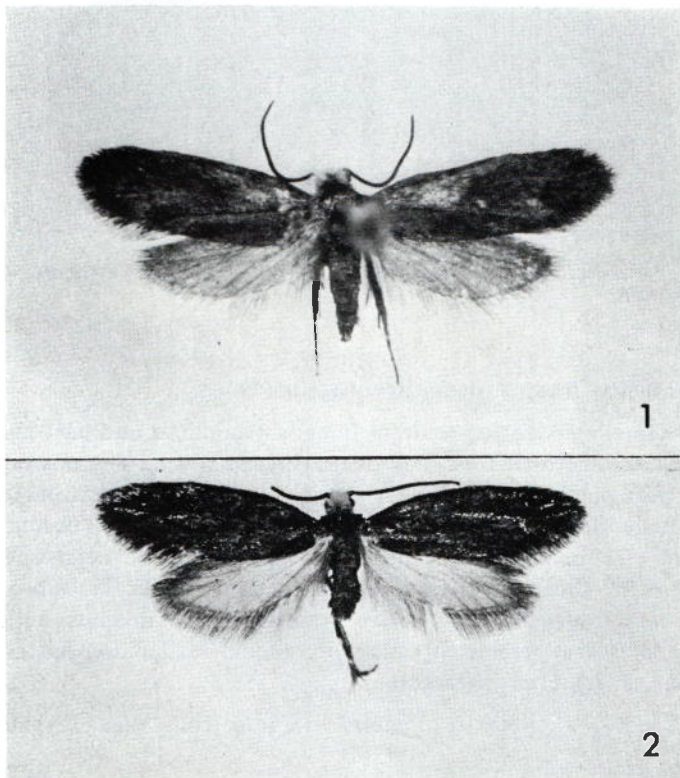


Fig. 1. *Paraclemensia europaea*, new species ; holotype female ; Viens (Vaucluse), France ; wing expanse 12 mm.

Fig. 2. *Paraclemensia acerifoliella* (Fitch) ; mâle ; S. March, Ontario, Canada ; wing expanse 11.5 mm.

The specimens were first sent to Dr. Klaus SATTLER of the British Museum (Natural History) who recognized them as *Paraclemensia*. Realizing that I was currently revising the New World *Incurvariidae*, Dr. SATTLER then forwarded a specimen to me for specific identification. I wish to thank both Dr. SATTLER and Dr. VIETTE for allowing me to study the material as well as Professor BUVAT for bringing this interesting insect to our attention.

***Paraclemensia europaea*, new species.**

ADULT (fig. 1). Wing expanse : ♂, 11.5 mm ; ♀, 12 mm.

Head : Vertex extremely rough, ochreous ; frons relatively smooth, fuscous. Antennae simple, 34-segmented, approximately 0.5-0.6 the length of forewing ; densely covered with short, slender, fuscous scales. Eyes reduced, greatest diameter less than interocular distance. Maxillary palpi five-segmented, the fourth (penultimate) segment the longest ; sparsely scaled, pubescent. Mandibles present, greatly reduced. Galeae reduced, approximately equalling the length of labial palpi, pubescent. Labial palpi three-segmented ; vestiture pale yellow with concentration of fuscous along outer sides at apex of second segment ; a cluster of 6-8 dark, stout, spinose setae near apex of second segment.

Thorax : Dorsum of thorax and wings uniformly dark fuscous with a bluish-purple luster. Venter of thorax and wings as well as legs more grayish but lightly lustrous and uniformly dark. Prothoracic legs with epiphysis absent. Forewing 12-veined ; R1 arising from basal third of discal cell ; accessory cell well defined by radial crossvein ; M1 well preserved. Hindwing 8-veined ; medial veins all separate ; much lighter in color than forewings, gray.

Abdomen : Dark fuscous with a metallic bluish luster above, dark shiny gray ventrally.

Male genitalia (figs. 4-7) : Uncus indistinct, reduced to a broad caudal ridge. Vinculum and saccus broad, elongate and U-shaped. Valve relatively narrow at base, becoming more narrow toward apex ; two distinct rows of stout, peg-like spines situated near middle ; distal row with 3-4 spines ; basal row with 4-5 spines ; cucullus rounded, setose. Juxta prominent, complex, consisting of a large, elliptical, ventral plate which is weakly joined to a pair of elongate, acute arms situated dorsal to aedeagus. Aedeagus slender, equal to genitalia in length ; apex of vesica irregularly thickened, densely covered with numerous minute spinules.

Female genitalia (figs. 3, 10) : Apex of ovipositor slightly depressed, distinctly set off from posterior apophyses at point where apophyses divide ; apex of ovipositor acute and smooth when viewed laterally, bilaterally serrulate as viewed ventrally with a short, subapical row of 5-7 minute serrations on each side (fig. 10). Posterior and anterior apophyses well developed, elongate. Ductus bursae extended, slightly surpassing length of posterior apophyses ; caudal third of ductus with numerous, minute granular sclerotizations in wall. Busa copulatrix only slightly inflated ; signum absent.

Holotype. Viens (Vaucluse), France, elevation 500 m, ♀, coll. May 11, 1968 by R. BUVAT ; in the Museum National d'Histoire Naturelle, Paris.

Paratype. — Same data as holotype, 1 ♂ ; in the collection of R. BUVAT.

HOST. — Unknown.

DISTRIBUTION. — Known only from the type locality.

DISCUSSION. — Until the discovery of this species by Professor BUVAT, the only known member of the genus *Paraclemensia* was *P. acerifoliella* (Fitch), a common insect restricted to the northeastern United States and Canada. Superficially, *P. europaea* closely resembles its North American counterpart but may easily be distinguished by a number of morphological characters. Perhaps the most significant feature is the retention in the forewing of *P. europaea* of vein M1 which has been lost in *P. acerifoliella*. In addition, the radial crossvein, which aids in delineating the accessory cell, is frequently absent in the American species. These venational modifications have consequently resulted in the relatively shorter length of the apical (distad to the discal cell) portion of the forewing in *P. acerifoliella*. The venational differences which distinguish these two insects are of such significance (for this family in particular), that, under different circumstances, separate generic placements for *P. acerifoliella* and *europaea* would be in order. The sum total of their relationship, however, does not permit such a distinction.

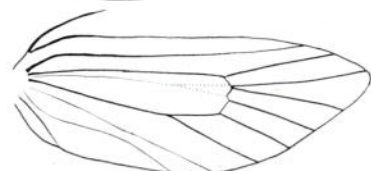
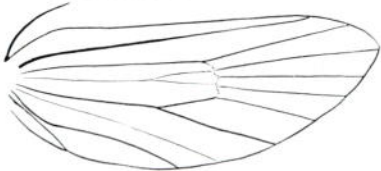
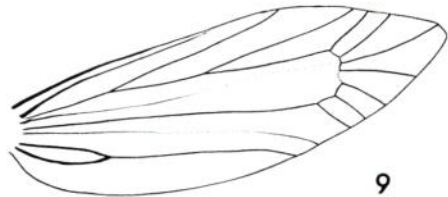
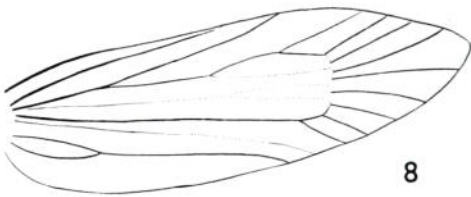
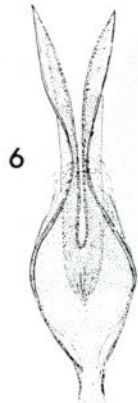
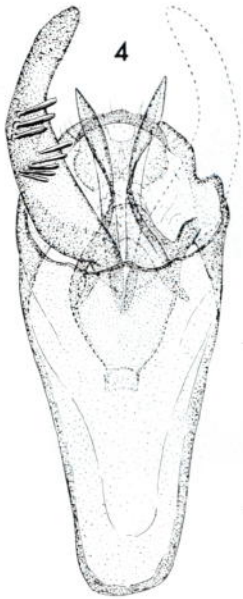
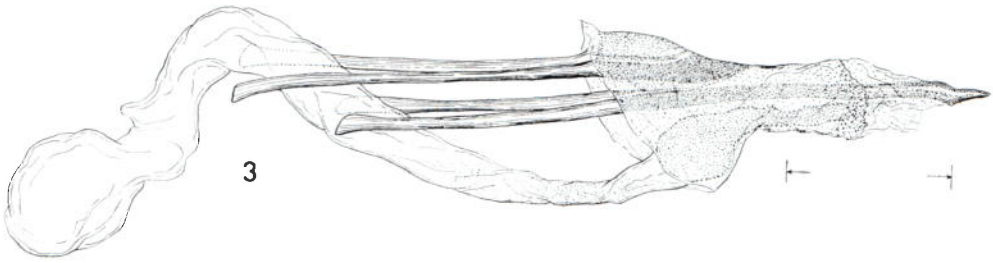
The male genitalia of the two species differ principally in the presence of two rows of small, blunt spines in *P. europaea* compared to one row in *P. acerifoliella*. In the female genitalia, the ductus bursae of *P. europaea* is nearly twice the length of that in the American species. Furthermore, their ovipositors differ with that of *P. acerifoliella* possessing only a single pair of blunt subapical teeth compared to the 5-7 pairs in the French species.

Ancestral models are often speculated in systematic treatises, much to the chagrin of evolutionists ; but, in the relatively simple case involving *Paraclemensia europaea*, the evidence seems clear. The North American *P. acerifoliella* appears to be a direct, and perhaps recent, derivative of the more generalized *P. europaea*. The loss of the radial crossvein and vein M1 in the forewing of *P. acerifoliella*, as well as the loss of the basal cluster of spines on the valvae, all point toward greater specialization.

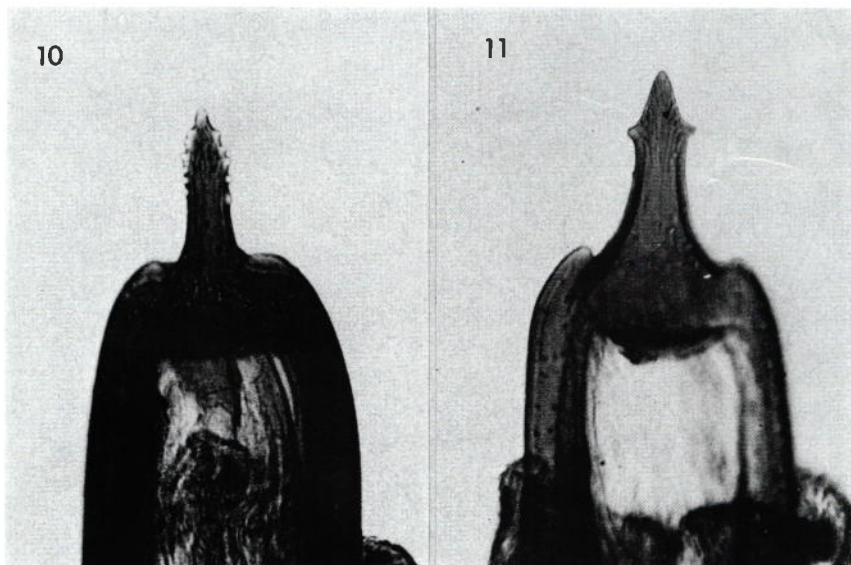
It is also interesting to note that these rather major anatomical changes may have evolved relatively rapidly, with the first introduction of *Para-*



Fig. 3-9. — 3, *Paraclemensia europaea*, lateral view of female genitalia (scale = 0.5 mm). — 4, *Paraclemensia europaea*, ventral view of male genitalia (scale for figs. 4-7 = 0.5 mm). — 5, lateral view of right valva. — 6, ventral view of juxta. — 7, aedeagus. — 8, wing venation of *Paraclemensia europaea*. — 9, wing venation of *Paraclemensia acerifoliella*.



clemensia into the New World being perhaps no earlier than the first part of the seventeenth century. Much earlier human contacts between North America and Europe are known to have occurred, but the relative frequency of post-Columbian traffic greatly increases the probability of introductions during the American Colonial Period. The present distribution of *P. acerifoliella* further suggests introduction from Europe during this period.



Figs. 10-11. Apex of ovipositor, ventral view. — 10, *Paraclemensia europaea*. — 11, *Paraclemensia acerifoliella*.

The supposed rapid speciation of *P. acerifoliella* is based upon the assumption that prior to its introduction, none of its present phenetic characteristics had appeared in the Palearctic populations of *Paraclemensia*. The distribution of *Paraclemensia* could also be explained, of course, by assuming that the two presently known species are mere remnants of an ancient and formerly much more extensive group which may have existed over much of the Holarctic Region. More collecting and information on the variability and possible speciation of *Paraclemensia* in Europe may shed some light on these assumptions.

The only two specimens of *P. europaea* currently known were collected during the day *in copula*. Nothing else is known of its biology other than the probability that it will resemble that of *P. acerifoliella*, which is well documented. As shown in fig. 12, the feeding injury of the American species is rather characteristic in that small circular areas of the host leaf are skeletonized, with usually a central core of leaf tissue being left intact.

The first instar larvae of *P. acerifoliella* commence feeding as serpentine leaf miners. At the beginning of the second instar, the larva emerges from the mine and constructs a portable, lenticular case. From this stage on, the feeding behavior is that of a skeletonizer. As the larva grows, it adds to the case by cutting out oval sections of leaves and attaching them to the top of the case in the manner of a shelter.

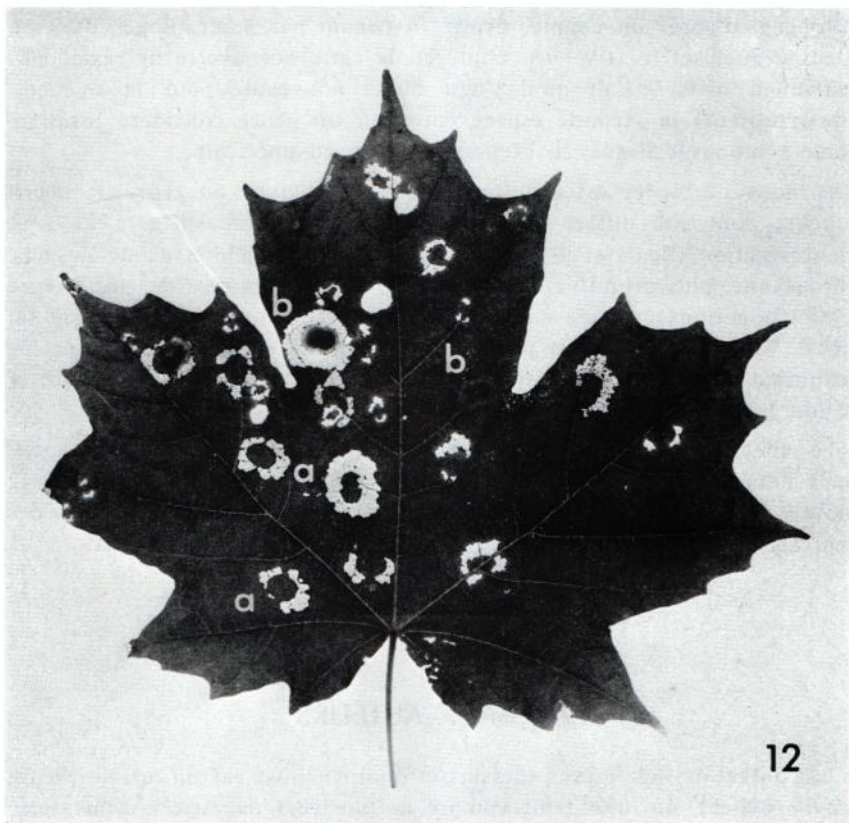


Fig. 12. Leaf of *Acer saccharum* Marsh showing feeding injury caused by *Pcraclemensia acerifoliella*. (a) typical feeding pattern ; (b) larval cases.

Prior to pupation the larval case is firmly attached to some substrate, usually a leaf. An oblong, silken cocoon or habernaculum is then constructed inside the case, surrounding the larva. The leaves eventually dehisce and fall to the ground where pupation finally occurs. The American species undergoes only one generation per year with the adults emerging in the spring (usually May).

The recorded hosts of *P. acerifoliella* include *Acer*, *Betula*, *Pirus*, *Quercus* and *Vaccinium*, with *Acer Saccharum* Marsh being preferred. Although no host is recorded for *P. europaea*, Professor BUVAT reports that the type locality is characterized principally by the plant genera

Quercus, *Acer*, *Crataegus* and *Pirus*, with *Quercus pubescens* Willd., dominating. Two species of *Acer* occur, *A. campestre* L. and *A. monspesulanum* L., and one of these may be the principal host.

Résumé

L'auteur décrit une espèce nouvelle d'*Incurvariidae*, *Paraclemensia europaea*, d'après un couple récolté *in copula* par le Pr. Roger BUVAT à Viens (Vaucluse) le 11-V-1968. L'intérêt de cette découverte ne réside pas seulement dans le fait qu'il s'agit d'une nouveauté pour la science : elle représente la seconde espèce connue d'un genre considéré jusqu'ici comme monospécifique et exclusivement nord-américain.

La nouvelle espèce est comparée avec l'espèce-type du genre, *P. acerifoliella*, dont elle diffère notamment par les genitalia (fig. 3 à 7) et la nervulation (fig. 8 et 9). L'espèce américaine semble issue de l'espèce européenne, plus primitive, et cela à une époque très récente, postérieure à l'introduction supposée en Amérique par l'Homme, donc, après le 16^e siècle. Mais on peut aussi penser que ces deux *Paraclemensia* sont les reliques d'un groupe systématique plus important autrefois répandu dans la région holarctique.

Le chenille et la biologie de *P. europaea* étant inconnues, quelques détails sont donnés sur la biologie de *P. acerifoliella* ; la fig. 12 montre une feuille d'Erable attaquée par la chenille (a) et portant des fourreaux larvaires (b).

AVIS AUX AUTEURS

La confection des figures (dessins et photos) illustrant un article est un travail délicat, qui doit tenir compte de plusieurs nécessités. Nous recevons souvent des figures défectueuses, qu'on a parfois le tort d'accepter. Les auteurs sont instamment priés de se reporter aux pages 219 et 220 de nos Conseils aux auteurs, dans *Alexanor*, IV [5], 1966 (tiré-à-part envoyé gratuitement sur demande).

PHOTOS. Les exemplaires groupés doivent être correctement alignés, horizontalement et verticalement ; on évitera l'effet désastreux de papillons disposés sans soin, certains complètement de travers. Pour l'alignement horizontal, se baser sur les bords internes des ailes antérieures et non sur l'axe du corps. Nous préférons de beaucoup *les fonds clairs* aux fonds noirs, d'aspect peu agréable.

DESSINS. Ne pas oublier que certaines figures seront réduites (pour économiser de la place ou toute autre raison) ; dans ce cas, les traits et points trop fins disparaissent à la reproduction si la réduction doit être importante (voir fasc. 6 du tome VIII, p. 287).