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## ON THE IDENTITY OF *EUXOA PUNCTIGERA* WALKER (LEPIDOPTERA, PHALAENINAE)

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There has always been a certain element of doubt concerning the identity of *Euxoa punctigera* Walker (1865, Catalogue of the Lepidoptera Heterocera in the British Museum, pt. 32, p. 661), the name having been based on a male specimen from Vancouver Island, British Columbia. *Pastoralis* Grote (1875, Canadian Ent., vol. 7, p. 68), described from a female from the same locality, was made a synonym by Hampson (1903, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 4, p. 219) who had both types before him in the British Museum collection. One of the main troubles has been the impossibility of matching any specimens from the type region with the figure given in the above-mentioned catalogue (pl. 62, fig. 12) which was drawn by Knight and purported to be a representation of the male holotype. According to this figure the primaries are dark brown, with little trace of maculation except some darker streaks along the veins in the terminal area; the secondaries are depicted as evenly dark brown, such coloration representing a character which is of considerable importance in separating groups in the genus *Euxoa*. It was after a study of this figure that the tentative suggestion was made in my recent paper on eastern *Euxoa* species (1950, Bull. Amer. Mus. Nat. Hist., vol. 95, p. 368) that *punctigera* might be closely related to the *perpolita* group and that the name, in fact, might take priority over *exculta* Smith, described from the southern British Columbian mainland. Correspondence with Mr. D. S. Fletcher of the British Museum, who was kind enough to examine both types and to make slides of the genitalic organs,

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elicited the fact that the above suggestion was quite erroneous and that the genitalia of both sexes showed no relationship to the very distinctive organs of the group in question.

Through the cooperation of the British Museum authorities, the holotypes of both *punctigera* and *pastoralis*, with their genitalic slides, were borrowed for study, and in consequence it has been possible to fix definitely the identity of the name in question. In this connection, for purposes of comparison, the considerable material in the Canadian National Collection at Ottawa has also been made available through the kind offices of Dr. T. N. Freeman.

It might be well to preface my remarks on the species with the statement that Knight's figure is distinctly poor and very misleading. This is in part understandable from the fact that Walker's type is not in good condition, the primaries being rubbed and almost denuded of fringes and maculation and showing traces of having been subjected to mold at some time. The secondaries are much too dark in the figure and actually show, under careful examination, though not very obviously, a gradual paling of the smoky color towards the base of the wing into what might be termed a dull hyaline. Grote's type is in much better condition, with the usual maculation much more sharply defined; the synonymy, as given by Hampson, is correct and will stand.

In the material from the Canadian National Collection there were no toptotypical specimens from Vancouver Island, but three males in perfect condition, collected by myself on July 24, 1933, at Seton Lake on the near-by mainland, prove to be an excellent match with Walker's type, both as regards color and faint maculation and also genitalia. One of these has been labeled as compared with type and agreeing with same. A pair of specimens from the near-by town of Lillooet are also placed here. Other British Columbian records include a small series of both sexes from Salmon Arm, collected by the late W. R. Buckell in late July or early August, and a single dwarfed female from Summerland. Certain males in the Salmon Arm series show a slight variation in genitalia, which is discussed in more detail below. As these specimens agree otherwise with the balance of the series, it would seem that a certain amount of individual divergence in these organs must be conceded, a not unusual happening in many species of *Euxoa*. According to the material available for study the range of the species extends southward into the Sierra Nevada Mountains of

California. A small series, collected by W. Bauer at Nelson Creek, Plumas County, cannot in any way be separated from the Seton Lake specimens. In the female genitalia, where this sex in the above-mentioned material has been available for dissection, no difference could be noted from the slide of this organ in Grote's type of *pastoralis*, confirming Hampson's synonymy.

*Atrofusca* Smith (1900, Proc. U. S. Natl. Mus., vol. 22, p. 447), based most probably on a mixed series but with a Glenwood Springs, Colorado, specimen marked as type, has been listed as a race of *stigmatalis* Smith (1900, *ibid.*, vol. 22, p. 425). It is, however, now known, from a comparison of slides of the genitalia of the male holotypes in the United States National Museum, that the two names refer to distinct species. In both male and female genitalia, on the other hand, *atrofusca* cannot be separated from *punctigera*. In a series from Eureka, Utah (Tom Spalding), originally from the Wolley-Dod collection which came to Ottawa by bequest, a slide of the genitalia of a male specimen taken in July, 1911, has been compared by Dr. T. N. Freeman with that of the holotype of *atrofusca* and marked as an exact match. A slide now made of the female organ from a specimen with the same collecting data shows agreement with the slide of the holotype of *pastoralis*. A specimen from the same locality was figured by Barnes and McDunnough (1912, Contributions to the natural history of the Lepidoptera of North America, vol. 1, no. 4, pl. 1, fig. 18). At the best *atrofusca* can be considered as only a doubtful race of *punctigera* from the central Rocky Mountain region west of the Continental Divide. It shows a slightly paler ground color of the primaries, tending more towards a deep fawn brown rather than the almost black-brown of typical *punctigera*. Specimens examined from Pullman, Washington, and Hamilton, Montana, tend, however, to intergrade between the two forms, and a few specimens from Oakland and Petaluma, California, could be better placed under *atrofusca* than under *punctigera*.

A characteristic feature of typical *punctigera* is the deep black-brown coloration of the thorax and primaries. There is a scattered sprinkling of whitish scaling in both areas, most prominent on the primaries at the base of the wing and below the costa; there are four small, white spots along the apical third of costa. The maculation is very indistinct in the males, somewhat better marked in certain females. The usual cross lines are practically obsolete; the spots are outlined in black, the claviform being a

small loop, often indistinguishable, the orbicular circular and the reniform fairly large and kidney shaped. There is a certain amount of pale scaling in both the orbicular and reniform, especially in females; Grote's type of *pastoralis* shows this distinctly, and Hampson's diagnosis of the species was evidently drawn up from this specimen. The fringes are concolorous with the rest of the wing. In the secondaries the outer half of the wing is deep smoky, this color paling gradually, and somewhat variably in individual specimens, to a dull hyaline in the basal area which shows a prominent discal streak. On the under side the hyaline color is much more obvious, only the costa and the costal half of the terminal area being sprinkled heavily with smoky. A dark discal streak is present and also a curved postmedian line which fades out before reaching the inner margin; there are traces of small, dark, terminal spots. The dark fringes show a better-defined, pale, basal line and tend to become paler outwardly. The male antennae are shortly serrate and fasciculate. The females from New York and Colorado, listed by Hampson under *punctigera*, do not belong here.

MALE GENITALIA: (Based on the holotype, fig. 1A.) Clasper broad and rather short; sides parallel, with the costal edge curving somewhat dorsally from base of cucullus to apex. Marginal spines of cucullus numerous, 20 to 23 in number. Sacculus weak, rather narrow, with slightly incurved costal margin beyond base; clavus represented by a group of five or six short setae at base. Harpes symmetrical, space between the two forks very broad and U-shaped, the ventral fork the longer of the two and extending to just beyond the ventral angle of the cucullus, curved slightly outward at base and then parallel to ventral margin of clasper. Dorsal fork curved sharply at base to cross the costal margin of clasper near its base, then upright; a few minute setae occur along its margins at intervals. Juxta plate moderately large, with the usual deep evagination between the two apical lobes, and the basal margin strongly drawn out centrally to a blunt point; the lateral edges are slightly more heavily chitinized and curve outward towards their base, the plate at this point showing its broadest width. Aedeagus curving ventrad towards apex, bilobed at apex; the vesica with three small apical spines, a rather unusual number.

A certain amount of variation appears to occur in some specimens of the series of males from Salmon Arm and also in those from Montana. In these the ventral fork of the harpe is shorter

than normal and subequal with the dorsal one; the sacculus is also slightly broader in the basal half. As no differences could

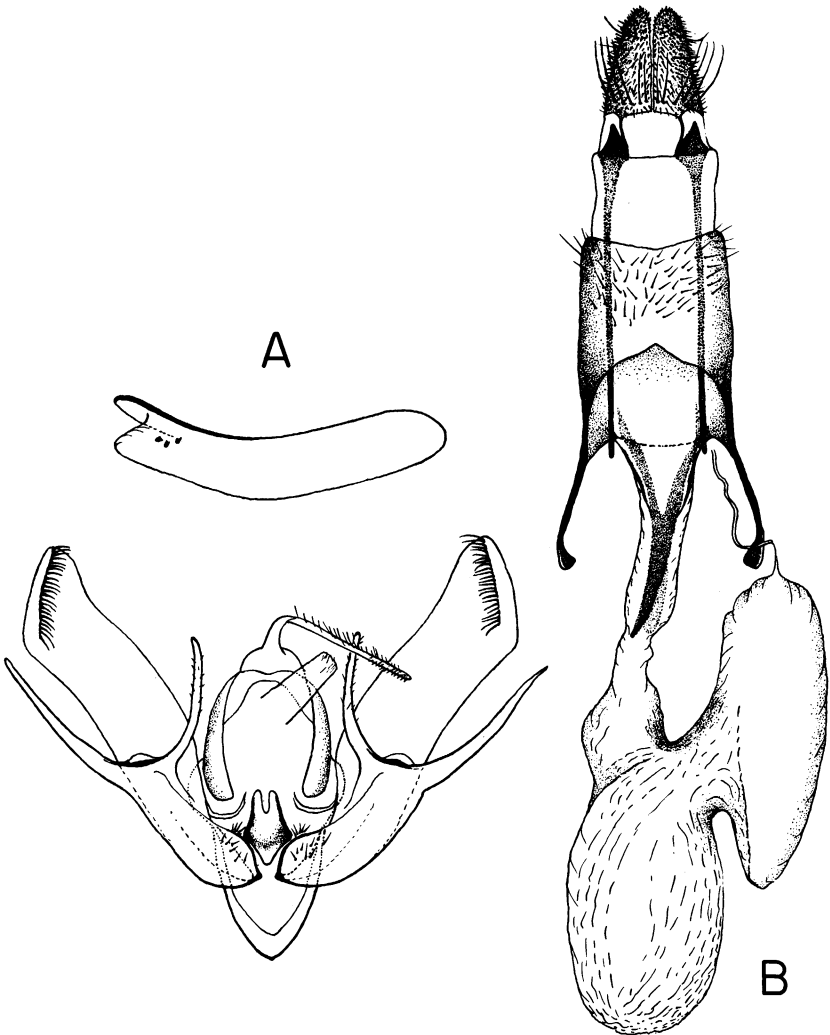


FIG. 1. *Euxoa punctigera* Walker. A. Genitalia of male holotype (British Museum). B. Genitalia of female that agrees in maculation with female holotype of *pastoralis* Grote (British Museum).

be detected in the color and maculation of these variants, it is considered better at the present time to attribute this to individual variation.

FEMALE GENITALIA: (Based on a specimen from Plumas County, California, fig. 1B.) The holotype of *pastoralis* and such females as were available from British Columbia show poorly inflated bursae, and for this reason a specimen from the above-mentioned locality was chosen for illustration; the genitalia of this specimen agree completely with those of the *pastoralis* type.

Ovipositor lobes well rounded apically and without chitinous projections; the opposing margins very closely approached. Apical area very heavily clothed with short setae which become somewhat longer and more scattered towards bases of lobes and are intermingled with a few longer hairs. Distinct basal row of about six long, fine setae. Ostium pouch funnel shaped, tapering rather abruptly into the long membranous ductus bursae which is somewhat broader than usual, extends far beyond the apices of the anterior apophyses, and broadens before entering the bursa on the right side, a little proximad of its middle. The usual dorsal and ventral chitinous rods are present and extend shortly beyond the apices of the above-mentioned apophyses; the dorsal rod is slightly longer and considerably more pointed apically than the ventral one. Bursa bilobed, with strong invagination on the left side about opposite the entrance of the ductus bursae; lobes subequal, the caudal one extending parallel to the ductus bursae to a point nearly on a level with the termination of the anterior apophysis; the ductus seminalis arises in normal fashion from the apex of this lobe.

There is a certain amount of variation in the apparent width of the ductus bursae and in the length and shape of the contained chitinous rods, but this is too slight to be considered as anything but individual. The greatest length of these rods was found in the single preparation from Eureka, Utah, of *atrofusca*, which in other details agreed fully with British Columbian material.