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GENITALIC VARIABILITY IN A SPECIES OF MOTH OF THE GENUS *EACLES* (LEPIDOPTERA, SATURNIIDAE)

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In the study of the taxonomy of many groups of animals the male copulatory organs play an important part. Often it is easier to determine a species by examination of these structures than in any other way, and in many groups of insects these structures are believed to be less variable within a species than are other morphological features.

Because of these facts it has often been assumed that the genitalic structures of the male and female fit in a lock and key fashion and are important among the isolating mechanisms that prevent interbreeding of closely related species. As has been indicated by Goldschmidt (1940) and Dobzhansky (1941), this point has been greatly overemphasized, although isolation of this sort may occasionally be important.

In the genus *Eacles*, although the species are for the most part distinguishable by external characteristics, the male genitalia are usually rather constant in structure and provide valuable specific characters. It is therefore of unusual interest to find in a series of *Eacles manuelita* Oiticica such extreme variability in genitalic structure that at first it seemed that two or three species must be involved.

Externally the 14 known male specimens of this species look very much alike, all being similar to the holotype figured by Oiticica (1941). The holotype, and only previously known male specimen, has been available for direct comparison with the series of 13 additional specimens. In some individuals the basal brown markings of the hind wings are less conspicuous than in the holo-

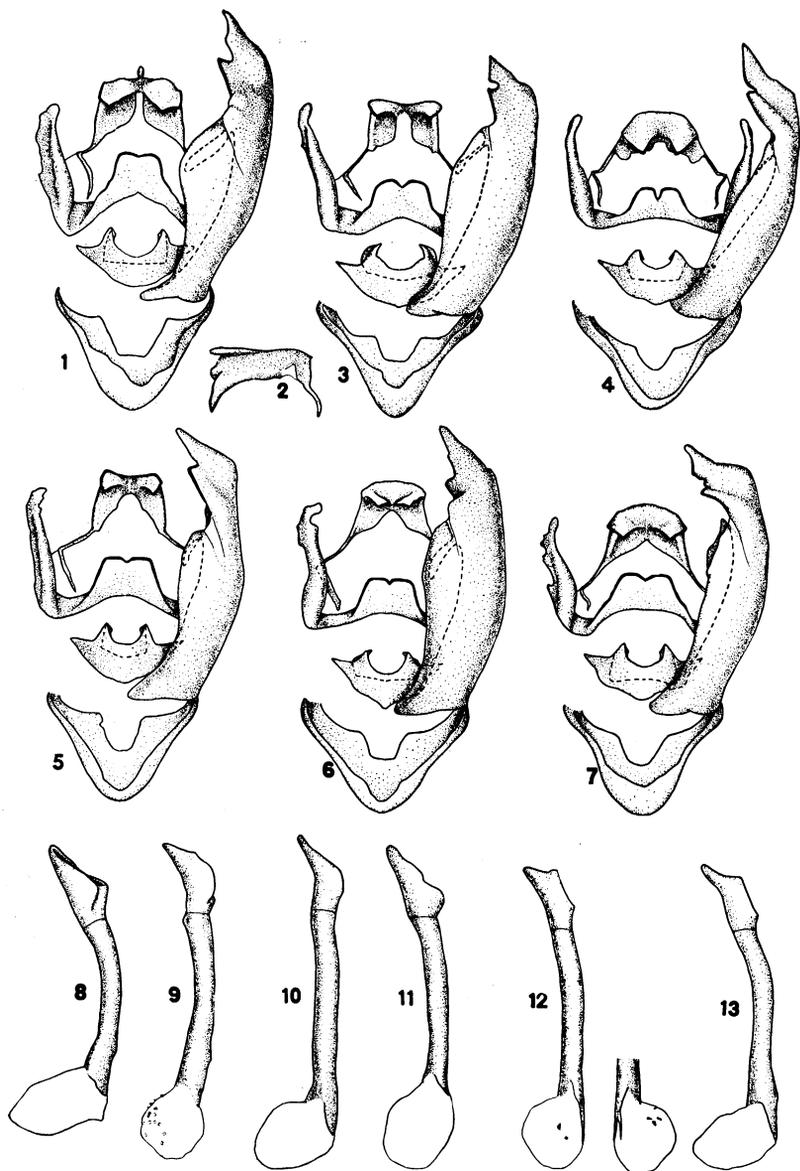


FIG. 1. Ventral view of male genitalia of holotype from Alagôas.

FIG. 2. Lateral view of uncus of same.

FIGS. 3-7. Ventral views of male genitalia: 3, specimen from Sergipe, genitalic preparation 4007, U.S.N.M.; 4, specimen from Sergipe, genitalic preparation 1581, A.M.N.H.; 5, specimen from Pernambuco, genitalic preparation 1582, A.M.N.H.; 6, specimen from Pernambuco, genitalic preparation 1583, A.M.N.H.; 7, specimen from Sergipe, genitalic preparation 1584, A.M.N.H.

FIGS. 8-13. Aedeagi: 8, holotype; 9, 4007; 10, 1581; 11, 1582; 12, 1583, with apex shown from opposite side; 13, 1584.

type, and in some the broad apical brown band of the hind wing is more yellowish, especially subapically. Otherwise very little variability was noted. Clearly there is less variability in color and pattern among available specimens of *E. manuelita* than among specimens of most species of *Eacles*.

The type specimen of *E. manuelita* is from the state of Alagôas, Brazil. Five specimens are from Pernambuco, Brazil, and eight from Sergipe, Brazil. All these localities are in a small area at the eastern extremity of Brazil. Although unfortunately the labels on the specimens give only the states in which they were collected and not precise localities, this area cannot be much over 300 miles long, the states concerned all being relatively small in size.

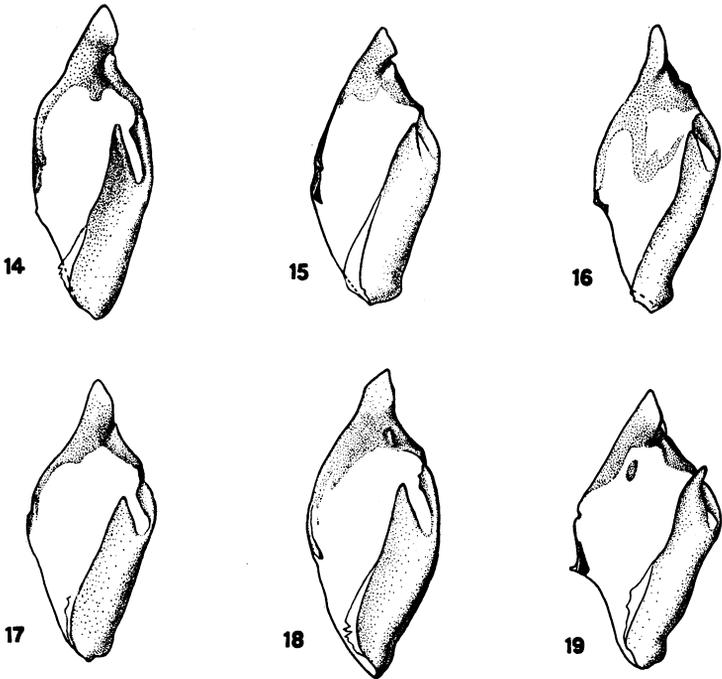
The range of variability of various genitalic structures is shown in the figures. The type specimen from Alagôas, a locality between Pernambuco and Sergipe, is unique in having a short subapical dorsal projection on the uncus (figs. 1 and 2). It also has the posterior lobes of the ninth tergum larger than in other specimens, although there is much variability in their size in the others, and in a few they are nearly as large as in the type.

The claspers vary markedly in shape. Not only are there differences in their dentition, but also in their general shape. They may be slender, as in the Alagôas specimen (fig. 14), or much broader, as in the specimen from Sergipe shown in figure 19. Every intergradation between these extremes exists.

The sac of the aedeagus is usually without spines or spicules in this species. However, in one specimen from Pernambuco there is a single minute spicule, in another (fig. 12) there are five or six, and in one specimen from Sergipe (fig. 9) there are numerous strong spicules.

In spite of this wide range of variability, the genitalia of *E. manuelita* are recognizably different from those of other *Eacles*, except *E. ducalis* Walker, 1855.¹ The genitalic variability here demonstrated eliminates the supposed differences in the male genitalia between *manuelita* and *ducalis*. This is especially true since a specimen of *ducalis* from Rio Vermelho, Santa Catarina,

¹ *Eacles manuelita* was originally described as a close relative of "*E. penelope ducalis*" Walker, 1855. This name was used by Oiticica (1941) because it was supposed that *ducalis* was a subspecies of *E. penelope* (Cramer) (1775, p. 70, pl. 45, fig. A ♂). We now know that *E. penelope* (Cramer) is the species also known as *E. majestalis* Draudt (1929, pl. 133b; 1930, p. 802) and that *E. ducalis* described by Walker (1855, p. 1374) from Rio de Janeiro is a quite different species from *E. majestalis* Draudt = *E. penelope* (Cramer).



FIGS. 14-19. Inner views of harpes: 14, holotype from Alagôas; 15, specimen from Sergipe, genitalic preparation 4007, U.S.N.M.; 16, specimen from Sergipe, genitalic preparation 1581, A.M.N.H.; 17, specimen from Pernambuco, genitalic preparation 1582, A.M.N.H.; 18, specimen from Pernambuco, genitalic preparation 1583, A.M.N.H.; 19, specimen from Sergipe, genitalic preparation 1584, A.M.N.H.

Brazil, in the collection of the American Museum of Natural History (genitalic preparation 173) has a dorsal process on the uncus similar to that of the holotype of *manuelita*, although slightly smaller. Thus the genitalic variability of *ducalis* is very striking, although not so great as that of *manuelita*. The differences in color pattern, and perhaps those of the female genitalia (Oiticica, 1941), remain to differentiate *manuelita*, which we suspect may be a subspecies of *ducalis*, rather than a distinct species.

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