ABNORMALITIES OF THE ANTENNAE, ELYTRA, AND HEAD POSITION IN THE PALES WEEVIL, *HYLOBIUS PALES* (COLEOPTERA: CURCULIONIDAE)

G. D. HERTEL

USDA Forest Service, Southeastern Forest Experiment Station,
Olustee, Florida 32072

ABSTRACT

The following abnormal conditions were observed in the adult pales weevil, *Hylobius pales* (Herbst): branching antennae with multiple clavolae; twisted and shortened elytra; head recessed into prothorax. None of the matings between normal adults and those with twisted and shortened elytra or between normal adults and those with head recessed into prothorax were successful. Only normal offspring were produced in the F_1 and F_2 progenies from matings between adults with branched antennae and normal adults.

Although no abnormal morphological characters have been reported for the pales weevil, *Hylobius pales* (Herbst), many have been reported for the boll weevil, *Anthonomus grandis* Boheman. The first visible phenodeviant reported for the boll weevil was an abnormal antennal condition in a lone male: the clavola of the left antenna was perfectly paired, but the right antennal club was cleft (Thomas and Brazzel 1960). Attempts at crossing this individual with wild females were unsuccessful. Bartlett (1964) later found 27 phenodeviants, of which only 2 were passed on to later generations. One of these was a male whose head was recessed into the prothorax with only the snout and deformed antennae protruding (=bashful). He was crossed with a virgin wild female and no phenodeviants appeared in the F_1 generation, but, in the F_2, 6 of 11 showed the bashful character. Bartlett (1965) later found a recessive lethal mutation in which the legs and elytra were twisted and shortened (=gnarled).

Six pales weevil adults (4 ♀, 2 ♂) exhibiting the phenotypically similar bashful trait were collected in 1966 and 1967 (Fig. 1). Of these, 4 (3 ♀, 1 ♂) had been reared in the laboratory on pine bolts (Moore 1966), 1 ♀ had been reared on meridic diet (Thomas 1969), and 1 ♂ was collected in the field in eastern North Carolina. All were paired with normal individuals of the opposite sex, but successful mating never occurred. The adults showed a lack of coordination in 1 or both of their anterior legs and never lived for more than 5 days.

Adults with gnarled elytra were collected in 1966 and 1967 in the field near Research Triangle Park, North Carolina. Four males and 2 ♀ were collected from lab rearings on natural host material in 1967. One ♂ had forked antennae. These adults were mated to normal adults, but no mutant offspring were observed.

Some of the weevils being reared on pine bolts were found to show branching in one or both of the antennae (Fig. 2). Occasionally, all the clubs appeared to be normal, but usually one of the clubs on the branched side was lighter colored, immobile, and, apparently, not functional. Of the 17 specimens collected, 10 were males and 7 were females. Of these, 8 had

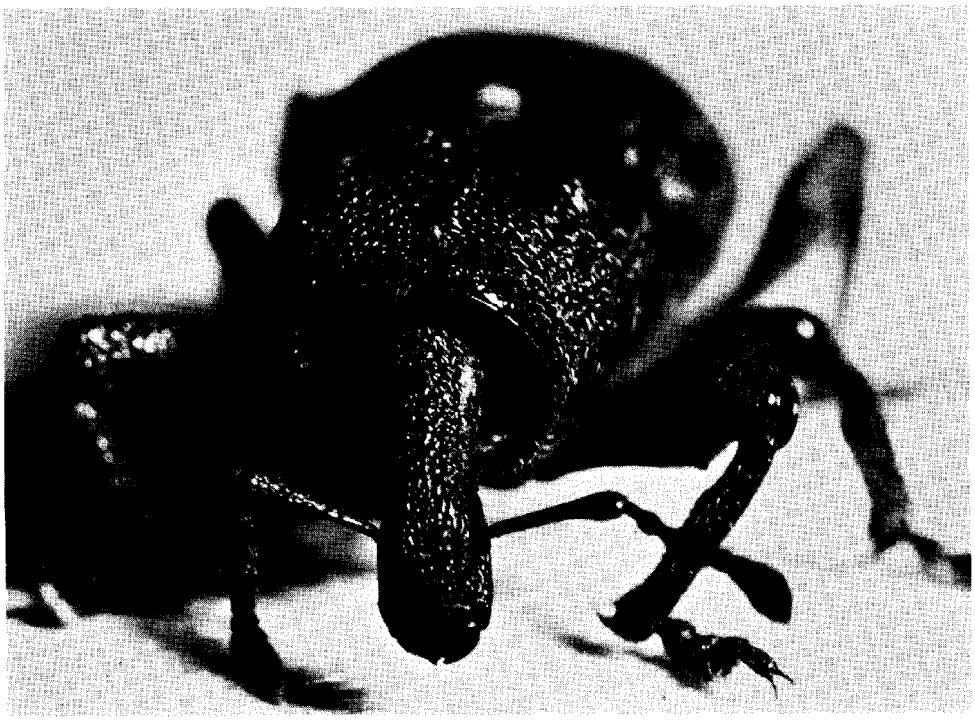

Fig. 1. Head of the pales weevil recessed into the prothorax.

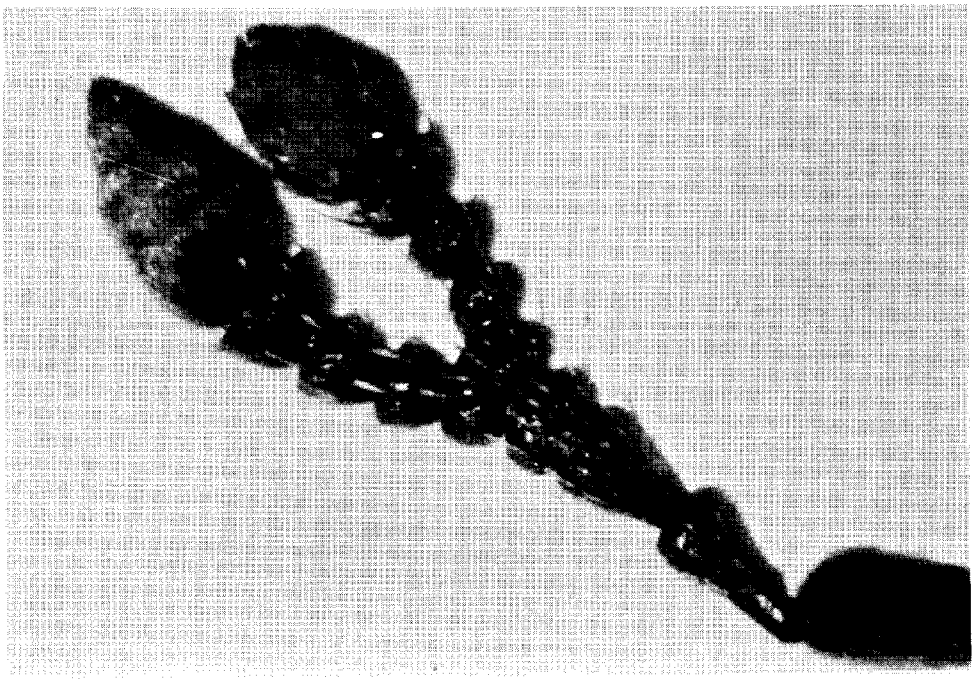

Fig. 2. Branched antenna of the pales weevil.

deformations on the left side (5 ♂, 3 ♀), 6 had deformations on the right side (4 ♂, 2 ♀) and 3 had them on both sides (1 ♂, 2 ♀).

In addition to the weevils having the branched antennae on 1 or both

sides, 1 female had 3 branches off the pedicel, and each had a normal clavola. In some cases, the pedicel was a single or bilobed stub. One female had 2 separate antennae (scape, pedicel, etc.) originating from the base on 1 side and perfectly paired. All the specimens were either paired with each other or with wild individuals to see if the characters would be carried over in successive generations. Of the 198 F_1 and 40 F_2 offspring, none were deformed.

Characters such as these, if genetically determined, can be important because they may be used as markers for field testing of radiation or chemically-induced sterility (Bartlett 1967), as inherited lethal characters for possible genetic population controls where sterilization is not applicable because of loss of vigor (LaChance and Knipling 1962), or as genetic markers which can be successfully used in resistance studies (Thomas and Brazzel 1960). It is best in all cases that the character be associated with simple inheritance.

ACKNOWLEDGMENT

I wish to thank Dr. H. A. Thomas, Southeastern Forest Experiment Station, Forestry Sciences Laboratory, Research Triangle Park, North Carolina, for providing the photograph for Fig. 1 and collecting some of the mutants.

LITERATURE CITED

Bartlett, A. C. 1964. Two confirmed mutations in the boll weevil. Ann. Entomol. Soc. Amer. 57: 261-2.

Bartlett, A. C. 1965. New mutants. Tribolium Inform. Bull. 8: 40-1.

Bartlett, A. C. 1967. Genetic markers in the boll weevil. J. Hered. 58: 159-63.

LaChance, L. E., and E. F. Knipling. 1962. Control of insect populations through genetic manipulations. Ann. Entomol. Soc. Amer. 55:515-20.

Moore, G. E. 1966. A technique for rearing the pales weevil, *Hylobius pales* (Herbst). Southeast. Forest Exp. Sta., U. S. Forest Serv. Res. Note SE-66, 2 p.

Thomas, J. G., and J. R. Brazzel. 1960. An abnormal antennal condition in a resistant strain of boll weevil. J. Econ. Entomol. 53: 688-9.

Thomas, H. A. 1969. A meridic diet and rearing technique for the pales weevil larva. J. Econ. Entomol. 62: 1491-4.

Fig. 1. Head of the pales weevil recessed into the prothorax.

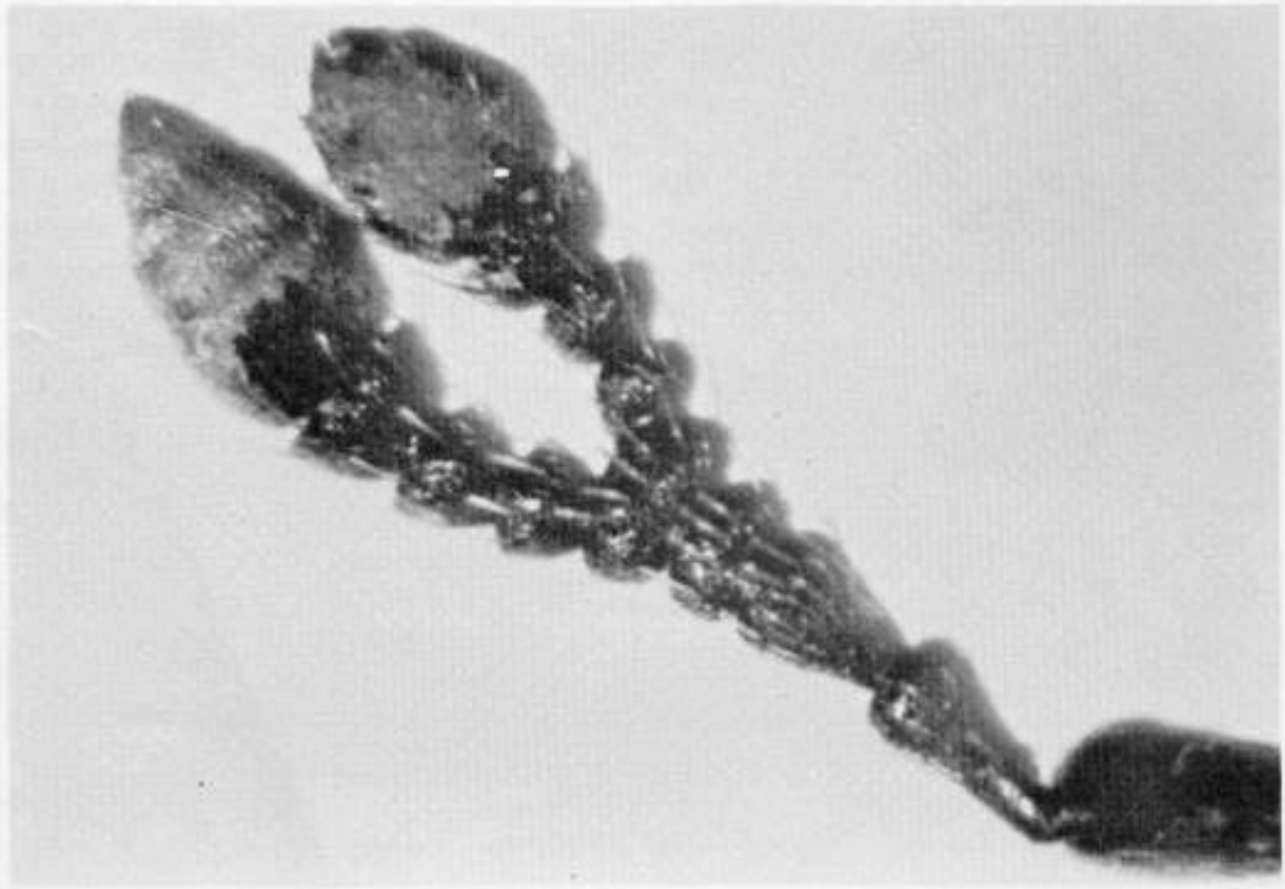

Fig. 2. Branched antenna of the pales weevil.