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LANGURIA ERYTHROCEPHALUS: HOST PLANTS, IMMATURE STAGES, PARASITES, AND HABITS (COLEOPTERA: LANGURIIDAE)[1]

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ABSTRACT

Languria erythrocephalus Blatchley has been little known since it was described in 1924. Larval hosts are maidencane, *Panicum hemitomon*, a native southeastern range grass and to a lesser extent paragrass, *P. purpurascens*, an introduced pasture species. Immature stages of *L. erythrocephalus* are described and the habits, natural enemies, and damage are discussed. The most important of several parasites were a braconid, *Heterospilus languriae* Ashmead, and a eupelmid, *Eupelmus cyaniceps* Ashmead.

Languria erythrocephalus Blatchley was described from 8 specimens swept from weeds along margins of a ditch at Moore Haven, FL (Blatchley 1924). Vaurie (1948) treated the species in her revision but presented only morphological information. She saw only 33 specimens collected between March and August. Otherwise, there appears to be no literature on this species except a catalogue listing (Leng and Mutchler 1927). Nothing was known about the habits, host plants, immature stages, or parasites until this study was undertaken.

HOST RELATIONS

In April, 1972, beetles were observed abundantly in the leaf whorls of maidencane, *Panicum hemitomon* Schult., most of these buds contained from 1 to 5 adults (apparently resting). Inspection of older canes showed that 98% had from 1 to 7 emergence holes of the approximate size to permit passage of the adult beetles (Fig. 1). When mature canes were split, no

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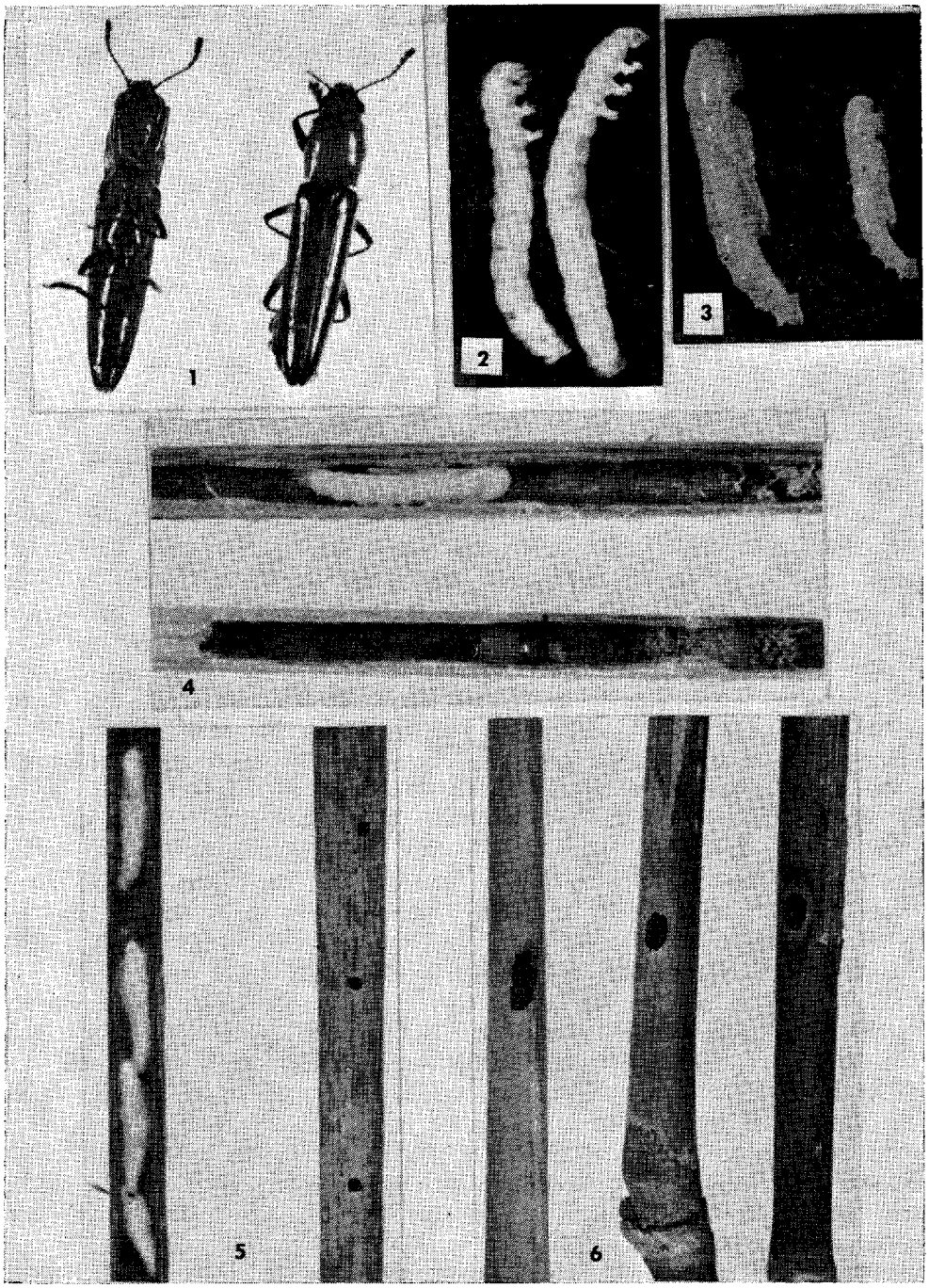

Fig. 1-6. 1) Adult *L. erythrocephalus*, ventral (left) and dorsal aspects. 2) Mature larvae of *L. erythrocephalus* showing size variation. 3) Pupae of same showing size variation. 4) Pupa and pre-emergent adult of the beetle in maidencane stems. 5) Cocoons of the parasite *H. languriae* and their emergence holes. 6) Emergence holes of the beetles in maidencane stems. Fig. 1, 2, and 3 are 5x, and 4, 5, and 6 are 3x natural size.

larvae were found. However, 1 pupa, a newly transformed adult, and a dead pre-emergent adult were found and gave sufficient evidence of breeding in maidencane stems (Fig. 4).

When young, more succulent canes were split, many eggs and typical languriid larvae of various instars were found in every stem. At the same time, a very light infestation was found in adjacant and interspersed paragrass, *Panicum purpurascens* Raddi. No evidence of infestation was found in broad-leaved plants sparsely interspersed in the maidencane. A similar languriid, *L. maculipennis* Schwarz, however, occurs in stems of *Amaranthus* sp. and kenaf, *Hibiscus cannabinus* L., in the observation area.

The Stages

EGG DESCRIPTION: Yellowish, elongate, slightly curved, and tapering slightly toward each end, but slightly rounded both anteriorly and posteriorly; 1.00 to 1.5 mm long, not resembling the almost reniform egg depicted for *L. mozardi* Latrielle (Comstock and Comstock 1916).

EGG PLACEMENT: Eggs are usually attached to the inner wall of the stem and protruding into the hollow center at an angle of 45° to 90°. A few eggs fall from this situation and either adhere flat against the stem wall or fall to the lower nodal septation. A maximum of 4 eggs was observed per internode.

LARVAL DESCRIPTION: Elongate, slender, and whitish to creamy; mature larvae may reach 14 mm long. They are much more slender than the figure for *L. mozardi* by Comstock and Comstock (1916) but very similar to Peterson's (1951) figure for that species, and of Boving and Craighead's (1951) figure for *L. angustata* Beauvois. Unlike certain stem-boring cerambycids, which they resemble superficially, these larvae have well-developed legs (Fig. 2), but lack the prominent dorsal ampullae characteristic of cerambycids. There are 10 abdominal segments, the 9th of these dorsally bearing a pair of prominent hook-like, brown-tipped urogomphi. Transverse rows of hairs occur dorsally and ventrally on each abdominal segment. A pseudopod, present on the 10th abdominal segment, may be somewhat more prominent than that shown by Peterson's (1951) figure for *L. mozardi*.

LARVAL ACTIVITY: Larvae feed on the inner surface of the host internode and on the nodal septations. This thick nodal tissue, however, is only rarely penetrated, and the entire immature period is thus usually confined to a single internode. To this point only 1 advanced instar larva has been found per internode, suggesting cannibalism.

PUPAL DESCRIPTION: About 7 to 10 mm long (Fig. 3); white to creamy; head tends to be hypognathus; pronotum more rounded and shorter than in adult; urogomphi still present; transverse row of 6 or 7 stout spines on each segment on dorsal abdominal surface.

PUPAL ACTIVITY: These are relatively active pupae that are capable of moving very freely in the cut stems when disturbed. Pupation occurs near a node with a frass and shaving plug above and sometimes below the pupa (Fig. 4).

ADULT DESCRIPTION: Adults were described by Blatchley (1924) who saw 8 specimens and by Vaurie (1948) who saw 33 specimens. Nothing of consequence can be added here, except for a greater length variation. Most specimens, in a series of 20 that were measured, ranged from 7.0 to 8.5 mm, but the extremes were 6.5 and 11.25 mm. In addition, greater color variation was noted than in the original description. The heads of a few specimens had a

variable-sized smokey or darkened area. Similarly, on some specimens the last abdominal segment was suffused with a darker pigment. The row of spines on the abdominal dorsum of the pupa disappears in the adult stage (Fig. 1).

ADULT ACTIVITY: Specimens are commonly found in the buds and on the stems of the host grass, often the male and female resting together or in copula. Although oviposition was not observed, marks on the wounded tissue indicate that the ovipositor may be inserted into the stem without previous mandibular preparation. In general, large adults emerged from stems or internodes of larger diameter, and small adults issued from smaller diameter stems.

SEASONAL OCCURRENCE

Detailed studies on the duration of stages and number of generations have not been made. However, there is some emergence and oviposition throughout the year. There is definitely a peak emergence of adults from mid-March to early April from eggs deposited in September and October and thus requiring about 6 months for the over-wintering generation. There appear to be 3 greatly overlapping generations during the next 6 months, probably varying somewhat with individual seasons.

NATURAL ENEMIES

During late March, larval parasitization by Hymenoptera was estimated to approach 50%. Parasites from field collected larvae were reared to the adult stage for identification (det. by E. E. Grissell, Table 1) with the approximate percentage of parasitization by each species.

Heterospilus languriae Ashmead is an internal parasite that, on emergence from the host (1 to 4, usually 2 or 3 from a single larva), spins an elongate, white cocoon in the stem (Fig. 5). The emergence holes of *H. languriae* are easily distinguished from those of the host species. Those of the parasite are smaller and rounder and usually with 2 to 4 per internode. Those of the languriid are much larger, more irregularly oval, frequently jagged, and with only 1 per internode (Fig. 6). *Eupelmus cyaniceps* Ashmead adults paralyze the host and oviposit on the host body. McGovern et al.

TABLE 1. PARASITES AND INCIDENCE OF PARASITIZATION IN *Languria erythrocephalus*, AREC, BELLE GLADE, 1973.

Species	Family	Approximate % parasitization
Heterospilus languriae Ashmead	Braconidae	35
Eupelmus cyaniceps Ashmead	Eupelmidae	10
*Ptinobius magnificus** Ashmead	Pteromalidae	1
Eurytoma sp.**	Eurytomidae	1

*New State record.
**An undescribed species (Det. P. N. Marsh, U.S. Nat. Mus.)

(1974) found that (contrary to previous thinking) *E. cyaniceps* was a hyperparasite of *Bracon mellitor* Say, rather than a parasite of boll weevil. In this instance *E. cyaniceps* was actually observed feeding on the languriid larvae. Clausen (1940) stated: "the genus *Eupelmus* and others (eupelmid genera) show a great diversity in habit, some are strictly primary external parasites, others obligatory hyperparasites and many appear indiscriminately in both roles." Some of the parasites with the host were removed from stems into pill boxes for convenience of observation. The eupelmid larvae fed externally, at first on a line parallel to the host body, but later generally at a 90° angle to the body. Only 1 eupelmid larva was observed per host. While the host is usually a larva, a pupa was parasitized in 1 instance. The adult wasp may not have effectively paralyzed the larva, and pupation may have been possible after oviposition, or even after incubation of the parasite egg. The eupelmid forms a naked pupa within the infested stems. A single specimen each of *Ptinobius magnificus* Ashmead (a striking, rich gun-metal blue species with yellow legs) and *Eurytoma* sp. were reared. These few parasites precluded close observations on their habits. No insect predators of the immature stages of the languriid were observed.

Economic Assessment

Although maidencane is an important and nutritious range grass (Leithead et al. 1971), even heavily infested stands appear not too severely affected. The grass in these cases, however, appeared less thrifty than uninfested stands. Occasionally where the larva moved too close to the growing point, the cane died. During high winds, some infested canes snapped off at points of larval emergence. The effects on paragrass, a common (and escaped) pasture grass, cannot be stated because of few observations. Attacks on this grass probably would be no more severe than on maidencane. We believe, however, that this languriid has an economic potential.

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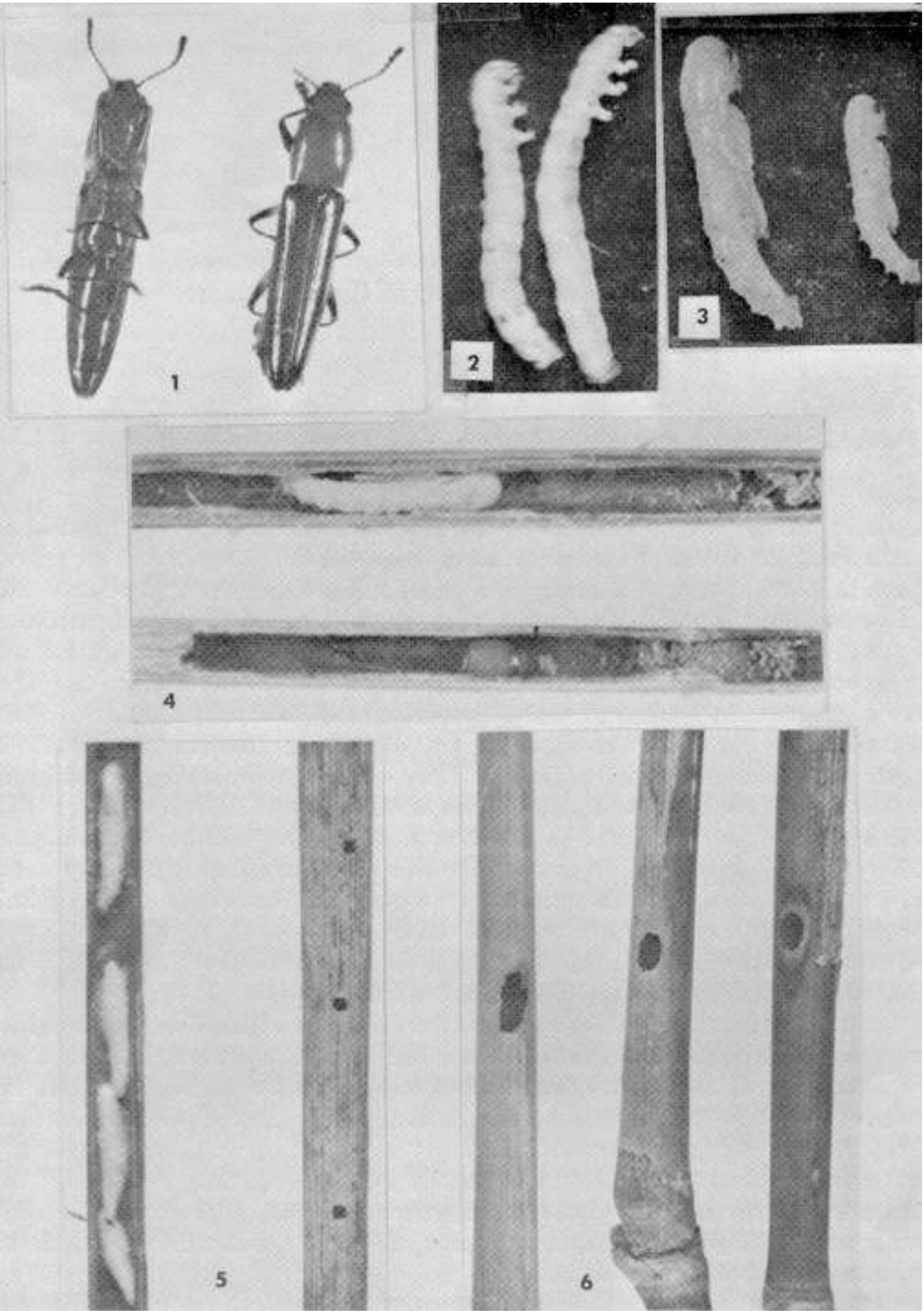
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