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## THE LIFE HISTORY OF AMBLYSCIRTES BELLI IN MISSOURI

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THE NORTHERN LIMITS OF AMBLYSCIRTES BELLI Freeman are reached in western Missouri and eastern Kansas where isolated colonies are found as far north as the Missouri River. In southern Missouri the species becomes more numerous and ranges rather widely through the southern states. Recent works regard *A. belli* as a subspecies of *Amblyscirtes celia* Skinner which occurs abundantly in southern Texas. In Missouri *belli* is a local species occurring along shaded creek beds, primarily in secluded, undisturbed habitats. Adults can be found resting on the damp creek beds or sunning themselves on nearby plants. The host in this region is *Uniola latifolia* Michx. Once beds of this grass have been located along a woodland creek, the chances are good that a colony of *belli* will be present. The first brood appears in the latter half of May from overwintering larvae with subsequent broods occurring in July and September. The following life history studies are based on material obtained in St. Clair County, Missouri near Osceola. Ova layed 28 - 30 May produced imagines 9 - 19 July. Males and females emerge together

EGG: The eggs are hemispherical, slightly flattened at the vertex. Color clear white, surface smooth and shiny with no pattern. Width 1 mm. there is a darkening of the dorsal area on the fifth day. Eclosion occurs on the sixth day.

FIRST INSTAR LARVA: Freshly emerged larvae are snow white with a thick covering of medium length white setae. The head and prothoracic shield are shiny black. After emergence the larvae move to a point midway up a leaf and start construction of the larval tent at the edge of a leaf. These first instar tents are 10 to 23 mm. in length and are formed by curling under the edge



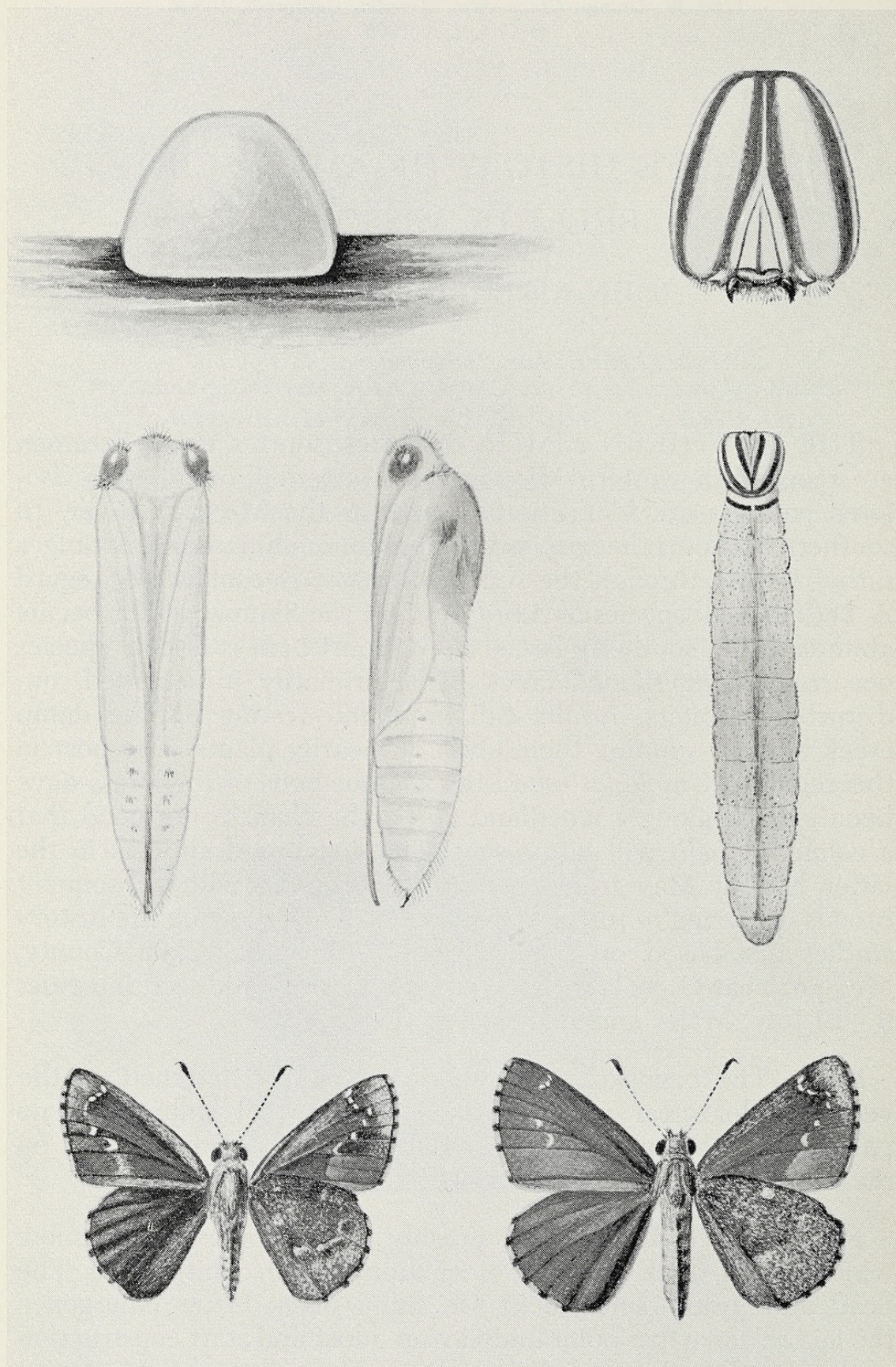


Fig. 1. The early stages of *Amblyscirtes belli*. Egg, lateral view. Mature larva and enlarged view of head capsule. Pupa, ventral and lateral view. Adult male and female, left side dorsal view, right side ventral view.



of the leaf and fastening it with strong silken strands. Larvae begin feeding on the second day and by the third day the body coloring has changed to a pale translucent green, paler posteriorly.

**SECOND INSTAR LARVA:** Body pale translucent green, thinly covered with short pale setae, those of the anal segment slightly longer. Prothorax paler green, prothoracic shield shiny black. Head unmarked, pale orange brown, sutures well defined, mandibles darker brown. The head bears a covering of minute white setae. Larval tent as in the first instar. The larvae are very pugnacious, thrashing the body about when the tent is touched. Larvae feed mostly at night with the day spent hidden away in the tent.

**THIRD INSTAR LARVA:** Body pale translucent green, thickly covered with a mixture of translucent and black setae. The anal segment is marked dorsally with a large black area composed in part of many short black setae. The spiracles are marked by small white raised dots and enclosed by a pale lateral band. The abdominal area is very pale greenish white. The prothoracic shield is shiny black, broader dorsally. Head pale orange brown with a broad vertical, grayish white band in each epicranial plate. The arms of the epicranial suture are narrowly edged with bands of the same grayish white. Mandibles bright reddish brown. Frons with two vertical white dashes. The entire head appears minutely pitted. A longer tent is constructed in this instar, 50 mm. in length along one side of a leaf. Larvae are very resentful of intrusion in this instar. If a light is shown on them or the leaf touched they throw their bodies wildly back and forth.

**FOURTH INSTAR LARVA:** Body translucent green, paler along the sides. The body is thickly covered with minute white setae. The dorsal area of the tenth abdominal segment is black with a covering of short black setae. The prothorax is white, the prothoracic shield shiny black. Head bright caramel brown with a white band edging the epicranial plates, narrow at the vertex, widest at the base of the jaws. There is a broad white band in the center of each epicranial plate starting at the base of the jaws and stopping just short of the vertex. The arms of the epicranial suture are edged outwardly with a narrow short white line. The frons are white with a caramel brown vertical dash. Mandibles darker brown. With the start of this instar a rapid increase in growth rate is noticeable. Larvae are more docile in this instar.

**FINAL INSTAR LARVA:** Length 23-27 mm. width of head case 2.25 mm. Body pale translucent green with a whitish overcast. There is a darker green middorsal line and a pale greenish



white lateral band along the sides. The intersegmental folds are pale yellow with small wrinkles between the folds. The body is thickly covered dorsally with short black setae changing to pale orange along the sides. The spiracles are marked by small white raised dots. The thoracic and anal spiracles are larger and narrowly ringed with black. Prothorax pale creamy white. The prothoracic shield is shiny black and is divided dorsally by a narrow white line. Head creamy white with orange brown bands. The posterior side of the head is ringed at the prothorax with a narrow orange brown band. The outer edges of the epicranial plates are banded from the vertex to the base of the jaws with orange brown and the arms and stalk of the epicranial suture are banded outwardly with the same color. The suture itself is marked by a pale white line, widest along the arms. The frons are white, narrowly, edged with orange brown and with a central dash of the same color. Labrum white, mandibles orange brown. The entire head is covered with short white setae. Final instar larvae construct their tent from an entire leaf and then devour the leaf from the tip back until only an inch or so of the tent remains. The old tent is then cut from the plant and the larvae move to another leaf where the procedure is repeated.

PUPA: Length 17-18 mm., width at wing cases 4 mm. Head and wing cases pale cream colored. Thorax light orange brown, abdomen pale yellow with pale orange rings at each intersegmental fold. Eye cases bright red. Eye cases and head with scattered patches of pale orange setae. Ventral side of the abdomen with scattered orange setae occurring in distinct patches bordering the tongue case which is bright orange brown and detached for the length of the abdomen. The thoracic spiracles are conspicuous as bright orange red dashes. The cremaster is pale reddish brown with a darker edging, curved ventrally and bluntly rounded with a small bulge at each side and on the apex. It is covered with stiff reddish brown setae. Pupation occurs in a sealed case made from a leaf of the host plant which is cut loose and lies among the dried leaves at the base of the plants. The case is thinly lined with powdery silk. Pupation occurs two days after construction of the cocoon. Imagines emerge from ten to thirteen days later in the summer broods. The larvae produced by the third brood hibernate in the fourth instar.

#### ACKNOWLEDGEMENT

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