TROPICAL LEPIDOPTERA, 8 (Suppl. 3): 29-31

NOTES ON LIFE HISTORIES OF *OBORONIA LIBERIANA* AND *OBORONIA ORNATA* (LEPIDOPTERA: LYCAENIDAE)

ANDREI SOURAKOV and THOMAS C. EMMEL

Dept. of Entomology and Nematology, University of Florida, Gainesville, Florida 32611;
Dept. of Zoology, University of Florida, Gainesville, Florida 32611, USA

ABSTRACT.– Females of two species of "White Blues," *Oboronia ornata* (Mabille) and *Oboronia liberiana* Stempffer, were observed to oviposit on the plants of *Costus dubius* and *Costus afer* (Costaceae), respectively, in the rain forests of Ghana, West Africa. The immature stages of these butterflies are illustrated and compared. Myrmecophily of the larvae is noted.

KEY WORDS: Africa, ants, Costaceae, eggs, Formicidae, Ghana, hostplants, Hymenoptera, larvae, *Leptosia*, Lycaenidae, myrmecophily, Pieridae, Polyommatini, pupae.

There are certain plants that serve as perfect homes for insects. For example, E. O. Wilson discusses a whole group of plants that he calls myrmecophytes, the anatomy of which is suitable for housing of an ant colony inside the plant (Wilson, 1971). The genus *Costus* (Costaceae) in Africa seems to be an example of such plants: the meaty calyces provide a nutritious food source for many species of insects and other invertebrates, and cavities left by the released seeds form shelters for these animals, including several species of ants. As to the benefits that might accrue to the plants which are attractive to the phytophagous invertebrates, resident ants might become an investment in security: ants probably keep most of the potential plant parasites and herbivores away.

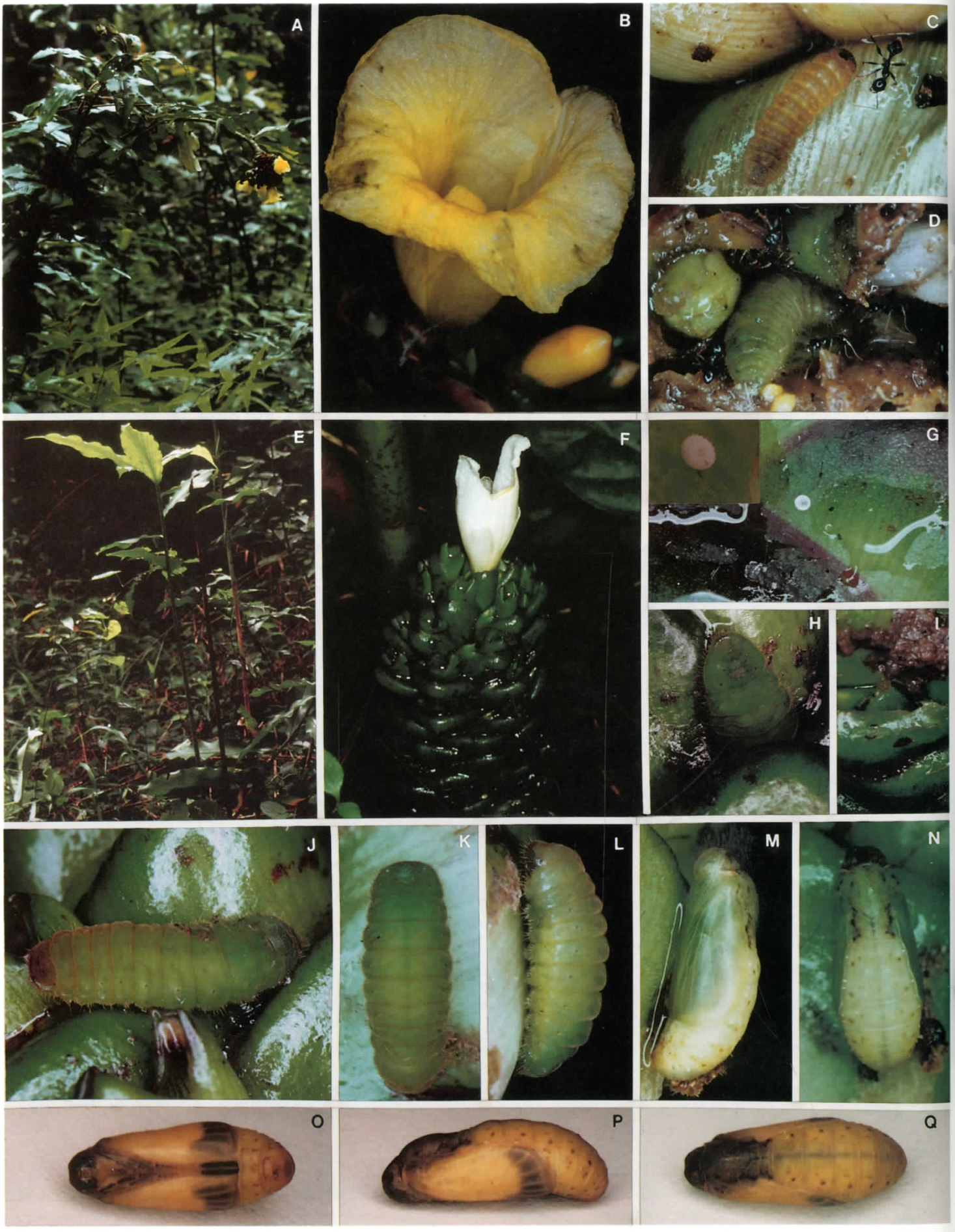
Larvae of many lycaenid species live in close symbiotic or parasitic association with ants and provide the latter with sweet secretions, for which these larvae sometimes gain a right to feed on the ants' immature stages. At least, these secretions "bribe" ants into not attacking lycaenid larvae. Our observations on two species of the genus *Oboronia* Karsch (Polyommatini) suggest the existence of such mutualistic relationships between ants and larvae of this lycaenid genus in West Africa.

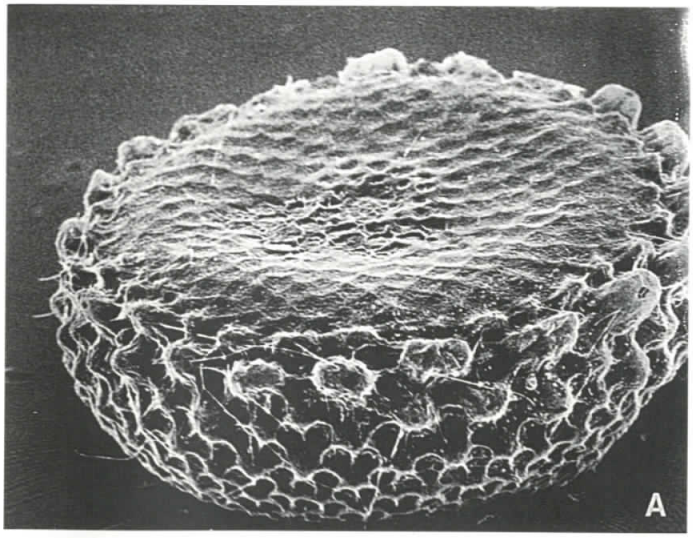
In August 1996, we observed a female of *Oboronia ornata* (Mabille) ovipositing on the surface of the calyx of *Costus dubius* (Afzel.) K. Schum (Costaceae) at Kakum National Park, Ghana. These butterflies, resembling the sympatric and abundant *Leptosia* pierids in appearance (Fig. 3) and manner of flight, were observed making their way into the dark understory of *Costus dubius* (Fig. 1E), where this species' flowering bodies are growing a few inches above the ground. These calyces, which resemble unusual mushrooms in appearance, are very thick and juicy organs, covered with a layer of mucus. They consist of many white-petaled flowers tightly packed together and at a different stages of development: from blossoming (usually not more than one at a time) to empty cavities formed by bracts where the seeds have already fallen out (Fig. 1F). Eggs are laid on the surface of the bracts, and the new larva burrows into the flower and feeds inside the calyces (Fig. 1G, H, I).

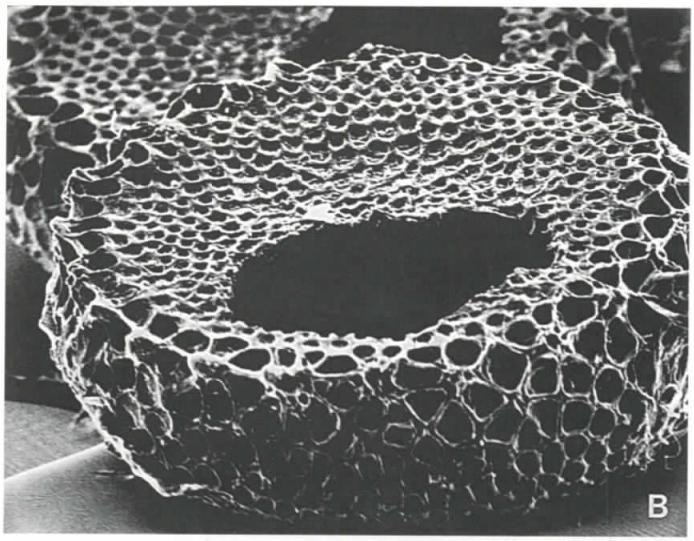
A week later, *Oboronia liberiana* Stempffer was observed ovipositing on the calyx of *Costus afer* Kér.-Gawl. at the Ankasa National Park. In this plant the flowers are located at the end of 2-3 meter-high shoots (Fig. 1A), and the yellow-petaled flowers (Fig. 1B) are arranged in a less tightly bunched calyces The larvae were found hiding between bracteoles and feeding on their soft and juicy surface.

Wherever we found larvae of *O. ornata* and *O. liberiana*, ant colonies populated the calyces as well. Interaction between ants and lycaenid larvae was observed: ants did not attack the larvae, but would approach them and palpate their surface continuously with antennae and palpi (Fig. 1C, D). We can safely assume existence of a mutualistic relationship between the ants and the larvae, similar to these now known in more than 50% of lycaenids (Fiedler, 1996) and noted for most of African Polyommatini (Ackery *et al.*, 1995). Our observations are also supported by the early work of Lamborn (1913), who found *Oboronia punctata* (Dewitz) in Nigeria to be associated with *Pheidole aurivilli* and *P. rotundata* ants nesting in the calyces of *Costus afer*. Lamborn observed the ants to follow larvae constantly while they burrow through the flower and even to remain with pupae during the whole pupal stage. He also exposed a larva to the red tree ants, *Oecophylla smaragdina* Fabricius (Formicidae), and found that even though the first ant "milked" a larva, later-arriving ants of the same group killed it.

In both species, the eggs are white and flat, 0.6mm in diameter and 0.2mm high. Some structural differences can be observed at a higher magnification (Fig. 2). In *O. ornata*, the egg bears short projections with aeropyles inside them, crowning the periphery of


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q





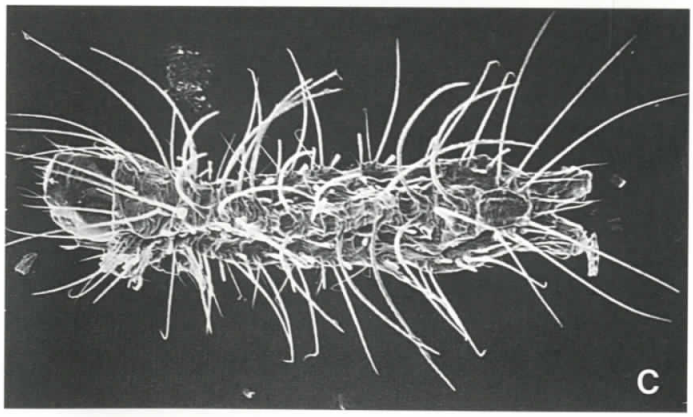


Fig. 2. (A) Egg of *Oboronia ornata* (X150); (B) Egg of *Oboronia liberiana* (X150); (C) First instar larva of *O. liberiana* (X100).

Fig. 1. (A-B) *Costum afer* Kér Gawl. at the Ankasa National Park, the food plant of *Oboronia liberiana*; (C-D) *Oboronia liberiana*, fourth and fifth instar larvae attended by ants; (E-F) *Costum dubius* (Afzel.) K. Schum (Costaceae) at Kakum National Park, the food plant of *Oboronia ornata*; (G) Eggs of *O. ornata* on the surface of flower body of *C. dubius*; (H-I) The last instar larva of *O. ornata* burrowing into the flower body of *C. dubius*; (J-L) Mature larva and prepupa of *O. ornata*; (M-N) Newly formed pupa of *O. ornata*; (O-Q) The pharate adult of *O. ornata* inside the pupa. (© 1997 Andrei Sourakov).

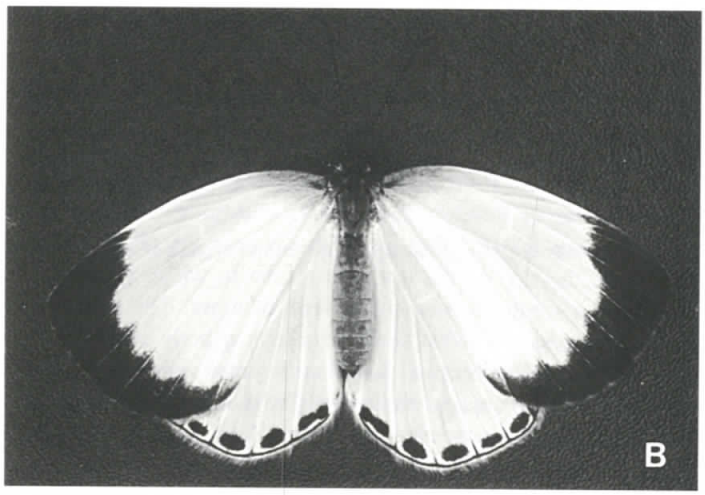


Fig. 3. Adult of *Oboronia ornata*, (A) Underside; (B) Upperside.

the upper margin of the egg (Fig. 2A). In *O. liberiana*, the egg has a regular disk shape, with numerous cavities, especially on the lateral surface. These cavities might serve as air sacs, keeping a ready oxygen supply for an egg exposed to frequent submergence under rainwater. This function is probably performed by aeropyles in *O. ornata*.

The first instar larva of *O. liberiana* is illustrated in Fig. 2C. It bears unusually long setae on the dorsal and lateral surfaces of the body. In both species, the earlier instars are pale brown (Fig. 1C), while the last instar is green (Fig. 1D, J, K). Pupae, green after pupation (Fig. 1M, N), later turn pale brown, showing the wing pattern before eclosion (Fig. 1O, P, Q).

Previously, *O. ornata* composed the monobasic genus *Athysanota*, closely related to the genus *Ornata*, which was composed of six species. The adults of all seven species are similar in appearance, and *O. ornata* was originally placed in a separate genus because it lacks tails on the hind wings, which are present in members of *Oboronia*. The observations presented in this work support similaraties rather than differences between these two genera, and validate T. B. Larsen's (pers. comm.) view that *Athysanota* and *Oboronia* species belong in one genus.

This paper is published as Florida Agriculture Experiment Station Journal Series No. R-05626.