



Floral Mimicry by *Epidendrum ibaguense* (Orchidaceae) in Panama

Thomas C. Boyden

Evolution, Vol. 34, No. 1. (Jan., 1980), pp. 135-136.

Stable URL:

<http://links.jstor.org/sici?sici=0014-3820%28198001%2934%3A1%3C135%3AFMBEI%28%3E2.0.CO%3B2-Z>

Evolution is currently published by Society for the Study of Evolution.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/ssevol.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

The JSTOR Archive is a trusted digital repository providing for long-term preservation and access to leading academic journals and scholarly literature from around the world. The Archive is supported by libraries, scholarly societies, publishers, and foundations. It is an initiative of JSTOR, a not-for-profit organization with a mission to help the scholarly community take advantage of advances in technology. For more information regarding JSTOR, please contact support@jstor.org.

FLORAL MIMICRY BY *EPIDENDRUM IBAGUENSE*
(ORCHIDACEAE) IN PANAMA

THOMAS C. BOYDEN

Department of Botany, University of Washington, Seattle, Washington 98195

Received February 6, 1979. Revised March 23, 1979

Mimicry in animals is a well-known field of research with an extensive literature. In contrast, the subject of mimicry in plants is an area which has received little attention by investigators. Wickler (1968) and Barlow and Wiens (1977) give examples of plant mimicry in their recent reviews, but experimental data demonstrating deception and its advantage to the plant are, in most instances, scant or lacking.

An interesting case of floral similarity occurs in Central America which involves three plant species: *Lantana camara* L. (Verbenaceae), *Asclepias curassavica* L. (Asclepiadaceae) and *Epidendrum ibaguense* HBK (Orchidaceae). These species are frequently sympatric, have flowers that are similar in color (orange and yellow) and are visited primarily by butterflies and hummingbirds and to a lesser extent, bees (Dodson, 1962; van der Pijl and Dodson, 1966). The flowers of *L. camara* and *A. curassavica* have nectar while those of *E. ibaguense* do not. These facts have led researchers (C. H. Dodson, H. G. Baker and others, pers. comm.) to hypothesize that *E. ibaguense* may be a mimic of the other two species, although no published accounts are available. By deceiving flower visitors with mimicry, plants of *E. ibaguense* are, in theory, spared the cost of producing nectar as a reward for pollinators.

While examining populations of these species in Panama in 1976, I had an opportunity to test this hypothesis. Specifically, I wanted to discover what rewards were offered by these plants, whether flower visitors were deceived by the mimicry, if such it was, and if there was a

means by which pollen could be transferred to the correct species.

I sampled flowers of these three species for nectar near Boquete, Panama. Sugar content of the nectar was measured in the field with a Bausch and Lomb hand refractometer. Only new flowers were sampled. The nectar of *L. camara* averaged 19% sugar by weight ($N = 25$), while that of *A. curassavica* averaged 35% by weight ($N = 32$). I obtained no nectar from the flowers of *E. ibaguense* ($N = 30$).

I witnessed only two visits to *E. ibaguense* flowers by insects in the Boquete area. Both of these visitors were monarch butterflies (*Danaus plexippus* L.). To determine whether or not individuals were visiting flowers of all three species, I captured ten monarchs and examined them with a dissecting scope. Each of these butterflies had pollen of *L. camara* on its head and thorax; one or more pollinia of *A. curassavica* attached to its legs; and one or more pollinia of *E. ibaguense* attached to the upper one-third of its proboscis. In all individuals the pollinia of *A. curassavica* and *E. ibaguense* were confined to these specific areas. Pollen of *L. camara* was generally on the head and ventral part of the thorax of *D. plexippus* but could sometimes be found on other parts of the body.

These observations, although limited, suggest that *E. ibaguense* may be a bona fide mimic of *L. camara* and *A. curassavica* and that monarch butterflies are deceived by the mimicry. The species-specific placement of the pollinia (and pollen) of these three species on different areas of the body of *D. plexippus* imply proper intraspecific pollen transfer, data which

lend essential support to the mimicry hypothesis.

ACKNOWLEDGMENTS

I thank Dr. Robert L. Dressler for numerous helpful conversations on this subject and the staff of the Smithsonian Tropical Research Institute for the use of their facilities.

LITERATURE CITED

BARLOW, B. A., AND D. WIENS. 1977. Host-parasite resemblance in Australian mistletoes: The case for cryptic mimicry. *Evolution* 31:69-84.

DODSON, C. H. 1962. The importance of pollination in the evolution of the orchids of tropical America. *Amer. Orchid Soc. Bull.* 31:525-534; 641-649; 731-735.

PIJL, L. VAN DER, AND DODSON, C. H. 1966. *Orchid Flowers, Their Pollination and Evolution*. Univ. of Miami Press, Coral Gables. 214 p.

WICKLER, W. 1968. *Mimicry in Plants and Animals* (trans. by R. D. Martin). World Univ. Library, McGraw-Hill, New York 255 p.

Corresponding Editor: R. Ornduff

SALE OF BACK ISSUES OF EVOLUTION

Special prices for numbers of *Evolution* to reduce inventory of back issues. Numbers available at \$3.00 each for regular members and \$2.00 each for student members of the Society:

- Vols. 1 through 4, all numbers
- Vol. 5, Nos. 2 and 4
- Vol. 7, No. 2
- Vol. 9, No. 1
- Vols. 10 through 29, all numbers

Order through the Treasurer's Office:

Robert E. Beer
Department of Entomology
University of Kansas
Lawrence, Kansas 66045
U.S.A.

EVOLUTION

SIX NUMBERS YEARLY

Beginning with this volume, *Evolution* is publishing six numbers per year. The Editor encourages submission of high quality manuscripts dealing with evolutionary biology, broadly defined.

LINKED CITATIONS

- Page 1 of 1 -



You have printed the following article:

Floral Mimicry by *Epidendrum ibaguense* (Orchidaceae) in Panama

Thomas C. Boyden

Evolution, Vol. 34, No. 1. (Jan., 1980), pp. 135-136.

Stable URL:

<http://links.jstor.org/sici?sici=0014-3820%28198001%2934%3A1%3C135%3AFMBEI%28%3E2.0.CO%3B2-Z>

This article references the following linked citations. If you are trying to access articles from an off-campus location, you may be required to first logon via your library web site to access JSTOR. Please visit your library's website or contact a librarian to learn about options for remote access to JSTOR.

Literature Cited

Host-Parasite Resemblance in Australian Mistletoes: The Case for Cryptic Mimicry

Bryan A. Barlow; Delbert Wiens

Evolution, Vol. 31, No. 1. (Mar., 1977), pp. 69-84.

Stable URL:

<http://links.jstor.org/sici?sici=0014-3820%28197703%2931%3A1%3C69%3AHRIAMT%3E2.0.CO%3B2-R>