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# FIRST REPORT OF *THEOCOLAX INGENS* XIAO AND HUANG (HYMENOPTERA: PTEROMALIDAE) IN THE WESTERN HEMISPHERE, WITH A SYNOPSIS OF THE GENUS

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*Abstract.*—*Theocolax ingens* Xiao and Huang is reported for the first time from the Western Hemisphere (Silver Spring, Maryland, USA). The known species of *Theocolax* Westwood are discussed and their host data summarized. *Theocolax fasciata* (Ishii 1956) is transferred from the genus and synonymized with *Cerocephala aquila* (Girault 1920) (**n. syn.**).

*Key Words:* Hymenoptera, Chalcidoidea, Pteromalidae, *Theocolax, Cerocephala,* new record, synonymy, Western Hemisphere

The genus *Theocolax* Westwood is known from eight species (Noyes 2001, Xiao and Huang 2001, Baur 2001). One of these species, *Theocolax fasciata* (Ishii), is herein transferred from the genus as explained below. The remaining seven species and their distributions are as follows: *T. bakeri* (Crawford), Oriental (Philippines); *T. elegans* and *T. formiciformis* Westwood, cosmopolitan; *T. frater* (Girault), Australian (Australia, introduced into Hawaii); *T. oblonga* (Delucchi), Afrotropical (Zaire); *T. phloeosini* Yang and *T. ingens* Xiao and Huang, Palearctic (People's Republic of China) (Bouček 1988, Noyes 2001, Xiao and Huang 2001, Baur 2001). The genus is thought to have originated in the Eastern Hemisphere based on the known distributions of its species. Only the cosmopolitan species *T. elegans* (Westwood) has been reported previously in the Nearctic (Bouček and Heydon 1997).

In this paper we report the discovery of *Theocolax ingens* Xiao and Huang in the Western Hemisphere (Maryland, USA) and summarize the known published information for other species of the genus. Species of *Theocolax* primarily attack small beetles, particularly Anobiidae and Scolytidae, in dead and dying trees, but *T. elegans* has been reported from beetles in stored grains (Bouček 1988, Yang 1989, Xiao and Huang 2001).

## *Theocolax* Westwood

*Theocolax* Westwood 1832: 127. Type species: *Theocolax formiciformis* Westwood, by monotypy.

There appear to be two morphological subgroupings of species in the genus *Theocolax*. One group contains *T. ingens* and *T. phloeosini,* in which the scrobal depression is bounded laterally by distinct angulate edges that nearly meet dorsomedially (Fig. 1), the interantennal lamella extends ½ way to the median ocellus, and the postmarginal

vein is nearly subequal in length to the stigmal vein (Fig. 2). The other group contains *T. bakeri, T. elegans, T. formiciformis,* and *T. oblonga* in which the scrobal depression is either not bounded laterally (i.e., the junction of the face and depression is rounded or indefinite) or if it is then the edges are widely separated dorsally (Fig. 3), the interantennal lamella extends only ¼ way to the median ocellus (Fig. 3), and the postmarginal vein is absent or distinctly shorter than the stigmal vein (Fig. 4). The species *Theocolax frater,* however, is somewhat intermediate between the two groups, having the scrobal depression and interantennal lamella of the former group, and the shorter postmarginal vein of the latter.

## Described Species of *Theocolax*

### *Theocolax bakeri* (Crawford)

*Cerocephala bakeri* Crawford 1914: 460–461.
*Theocolax bakeri* (Crawford): Gahan 1946: 357. Generic transfer.

This species was described from the Philippines. Baltazar (1966) listed the host as a scolytid.

### *Theocolax elegans* (Westwood) (Figs. 3, 4)

*Choetospila elegans* Westwood 1874: 157.
*Theocolax elegans* (Westwood): Bouček 1988: 339. Generic transfer.

This is a "cosmopolitan parasite of small beetles developing in stored grain" (Bouček 1988). It is the only species previously reported from the Nearctic (Burks 1979) (as *Choetospila elegans*).

### *Theocolax formiciformis* Westwood

*Theocolax formiciformis* Westwood 1832: 127.

Although this is a "cosmopolitan parasite of anobiid beetles in dead wood" (Bouček 1988), it is not yet known from the Nearctic.

### *Theocolax frater* (Girault)

*Spalangiomorpha frater* Girault 1913: 334.
*Theocolax frater* (Girault): Bouček 1988: 340. Generic transfer.

This species may belong to the genus *Cerocephala* according to Bouček (1988), but little is known about it. No hosts have been reported. It is known from Australia (Bouček 1988) and Hawaii (Nishida 2002).

### *Theocolax ingens* Xiao and Huang (Figs. 1, 2)

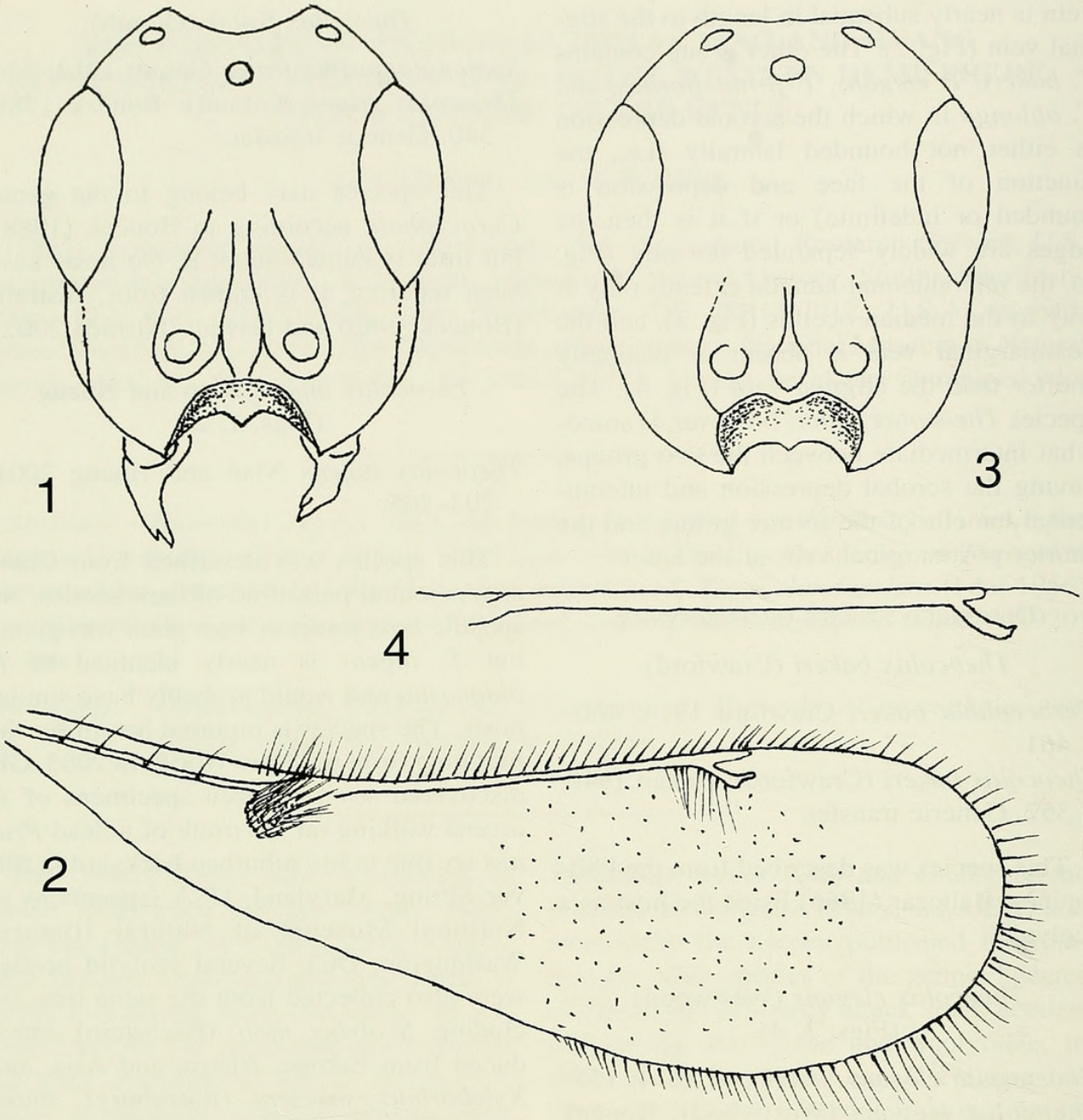
*Theocolax ingens* Xiao and Huang 2001: 203–205.

This species was described from China as a potential parasitoid of bark beetles. No specific host insect or host plant was given, but *T. ingens* is nearly identical to *T. phloeosini* and would probably have similar hosts. The species is reported herein for the first time from the New World. In 2003, GH discovered several dozen specimens of *T. ingens* walking on the trunk of a dead *Prunus* sp. tree in his suburban backyard in Silver Spring, Maryland, USA (specimens in National Museum of Natural History, Washington, DC). Several scolytid beetles were also collected from the same tree, including *Scolytus mali* (Bechstein) introduced from Europe, Africa, and Asia, and *Xyleborinus saxeseni* (Ratzeburg), introduced from Europe. Because *T. ingens* and *T. phloeosini* are Palearctic in origin, it appears that *T. ingens* was accidentally introduced into the United States with wood products exported from China.

### *Theocolax oblonga* (Delucchi)

*Cerocephala oblonga* Delucchi 1956: 168–171.
*Theocolax oblonga* (Delucchi): Baur 2001: 69. Generic transfer.

This species is known only from material collected in Zaire (Kivu Province). It was reared from *Mimips rugicollis* Schedl (Coleoptera: Scolytidae).




Figs. 1-4. *Theocolax* species. 1–2, *Theocolax ingens*. 1, Face. 2, Forewing. 3–4, *Theocolax elegans*. 3, Face. 4, Forewing marginal, postmarginal, and stigmal veins only.

*Theocolax phloeosini* Yang

*Theocolax phloeosini* Yang 1989: 97–99 (Chinese), 101–102 (English).

This species, known only from China, was originally reared and collected from trunks and branches of *Sabina chinensis* (L.) [Chinese juniper] infested with *Phloeosinus aubei* Perris (Coleoptera: Scolytidae) and *Prunus persica* (L.) [peach] infested with *Scolytus japonicus* Chapuis (Scolytidae). Adult wasps were reared as ectoparasitoids of larvae of these two beetles. Additional material was collected on *Ulmus pumila* L. [elm] infested with *Scolytus schevyrewi* Seminov and *S. butovitschi* Stark (Scolytidae). Adult wasps were reared as ectoparasitoids of pupae and larvae collected from galleries of these bark beetles. Two generations were collected between April and July. An additional report by Yang (1996) added the following hosts: *Scolytus seulensis* Murayama (Scolytidae) on *Prunus armeniaca* L. and *P. persica*,

and "many other bark beetle species" on the trees *Pinus tabuliformis* Carrière, *P. massoniana* Lambert, and *Picea* spp. He also reported that the female enters into galleries to oviposit.

### Species Removed from *Theocolax*

*Choetospila fasciata* was described by Ishii (1956). The original holotype specimen, a unique male collected in Tokyo, Japan, was drawn by Ishii at an earlier date, but by 1956 the specimen had been ". . . devoured by a carpet beetle." For that reason Ishii based his written description on a fairly detailed drawing. The species has not been recognized since its description, and nothing is known of its biology. It was placed in *Theocolax* by implication when Bouček (1988) synonymized *Choetopsila* with *Theocolax*. The original illustration by Ishii (1956) clearly shows a combination of a sculptured propodeum and longitudinally striate scutellum, which is unique to *Cerocephala aquila* (Girault), a widespread Indo-Australian species found also in Fiji, the Philippines, Cuba, and Mexico (Bouček 1988). The synonymy for this species appears as follows:

*Cerocephala aquila* (Girault)

*Proamotura aquila* Girault 1920: 143.

*Cerocephala aquila* (Girault): Gahan 1946: 361. Generic transfer.

*Choetospila fasciata* Ishii 1956: 31–32. **New Synonymy**.

*Theocolax fasciata* (Ishii): Bouček 1988: 339. Transfer by implication, *Choetospila* Westwood 1874 synonymized with *Theocolax* Westwood 1832.

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