

# Entomofauna

ZEITSCHRIFT FÜR ENTOMOLOGIE

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Band 11, Heft 6

ISSN 0250-4413

Ansfelden, 30. April 1990

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Review of the biology and host plants of the  
Australian longicorn beetle  
*Phorocantha synonyma* Newman, 1840  
(Coleoptera, Cerambycidae)

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## Abstract

The larval host plants and general biology of the Australian longicorn beetle *Phorocantha synonyma* NEWMAN, 1840 (Coleoptera, Cerambycidae, Cerambycinae) are reviewed from the published literature and from recent personal observations in the field. Larvae feed in the dead wood of several species of the genus *Eucalyptus* and *Angophora* (Myrtaceae), and as much, appear to be monophagic at the family level. The recorded larval hosts are *Angophora floribunda*, *Eucalyptus citriodora*, *E. crebra*, *E. grandis*, *E. microcorys*, *E. moluccana*, *E. propinqua*, *E. racemosa*, *E. resinifera* and *E. saligna*. *E. crebra* is newly recorded here. Of the above records, the records of *E. racemosa* and *E. resinifera* are doubtful and need further confirmation. No adult food plants are known and adults are mainly nocturnal in habits.

The medium-sized, orange-brown and black longicorn beetle *Phorocantha synonyma* NEWMAN, 1840 (Cerambycidae, Cerambycinae, Phorocanthini) (Fig.1) is widely distributed in woodlands and dry sclerophyll forests of eastern Queensland, New South Wales and south-eastern Victoria (HAWKESWOOD, unpubl.data). The species has had a difficult taxonomic history. NEWMAN (1840:19) provided the replacement name *P. synonyma* for *Stenocorus punctatus*, a name preoccupied for another related *Phorocantha* species. KIRBY (1818:470) was obviously unaware of this fact when he described *S. punctatus*. GAHAN (1893:172) used the correct name but erroneously listed the species as occurring in Western Australia, an error that was repeated by Mc KEOWN (1947:27). TILLYARD (1926:233, fig.R 63) correctly illustrated the species. CARTER (1929:129) keyed the species and noted that *Tryphocaria solida* BLACKBURN (BLACKBURN 1893:194) was similar to *P. synonyma* but did not synonymize it. Mc KEOWN (1947:30) also listed *T. solida* as a separate species. The only modern author recognizing that *T. solida* = *P. synonyma* was DUFFY (1963:81) but he did not formally synonymize these taxa since his work was largely descriptive of early life stages and their ecology. Clearly there are problems with the taxonomy of some Australian Phorocanthini. Since *P. synonyma* is the older name it is used here. The biology and host plants are discussed here.

### Larval hosts

DUFFY (1963:81) published the first 6 larval hosts known for this beetle, viz.- *Angophora floribunda* (SM.) SWEET (as *A. intermedia*), *Eucalyptus racemosa* CAV.(as *E. micracantha*), *E. microcorys* F.MÜLL., *E. propinqua* DEANE et MAIDEN, *E. resinifera* SM. and *E. saligna* SM. Of these records, DUFFY (1963:82-83) provided collecting data for only four from museum voucher specimens: *E.racemosa* - Pechey (c 29°30'S, 152°50'E), Queensland, 3.Sept.1941, A. R. BRIMBLECOMBE; *E. microcorys* - Byfield, Queensland, (22°50'S, 150°40'E), Nov.1938, A.R. BRIMBLECOMBE; *E.propinqua* - Pechey, Queensland, 5 March 1937, A.R. BRIMBLECOMBE; *E. saligna* - Lisarow, New South Wales, (33°23'S, 151°23'E), 4 Nov.- 2 Dec.1956, K.M. MOORE (this record

is also listed in WEBB 1987, see later). It should be noted that *E. racemosa* does not naturally occur in Queensland (CHIPPENDALE & WOLF 1981:123) so the above record by BRIMBLECOMBE appears to be erroneous and need further confirmation. Also, since DUFFY (1963) provided no voucher specimens data for his listing of *E. resinifera*, and no subsequent author has listed this tree as host, this record is in doubt and needs further confirmation. WEBB (1987:7) listed (incompletely) some further host records from museum specimens in New South Wales collections. These are summarized here as follows: *Angophora intermedia* DC. (= *A. floribunda* (SM.) SWEET), Lisarow, New South Wales, 1954, K. M. MOORE; *E. citriodora* HOOK., La Perouse, Sydney, New South Wales, 1978 & 1982, E.E. TAYLOR; *E. grandis* W. HILL ex MAIDEN, Coffs Harbour, New South Wales, 30°09'S, 153°07'E, 1986, R.H. ELDRIDGE; *E. saligna* SM., Lisarow, New South Wales, 1955-57, K. M. MOORE. It should be noted that according to CHIPPENDALE & WOLF (1981:101), *E. citriodora* does not naturally occur in New South Wales, so presumably this record from La Perouse in Sydney, is from a cultivated specimen.

HOCKEY & DE BAAR (1988:63) recorded *Eucalyptus grandis* W.HILL ex MAIDEN, as a host from Maryborough, Queensland (25°32'S, 152°42'E) (adults emerged during 29 August to 30 December 1986). HOCKEY & DE BAAR (1988) incorrectly listed this beetle as *Tryphocaria solida* BLACKBURN and claimed their record as new, but *E. grandis* was previously recorded by WEBB (1987:7; see above).

WEBB, WILLIAMS & DE KEYZER (1988:98) recorded *Eucalyptus moluccana* ROXB. (incorrectly cited as *E. molluccana*) as a host from La Perouse, Sydney, New South Wales (adult emerged 20 Nov. 1983). They provided no other details on the biology of *P. synonyma*.

There have been obtained fragments of a dead adult from a dead branch (near the base) of a fallen *Eucalyptus crebra* F.MÜLL. on the 1 July 1988, from semi-cleared dry sclerophyll forest/open woodland, about 20 km NW of Goombungee, west of Toowoomba, Queensland (27°15'S, 151°48'E). No other material was obtained. The beetle remains were situated in a large pupal chamber measuring 37 mm long, 8 mm wide and 7 mm high. One end led out-

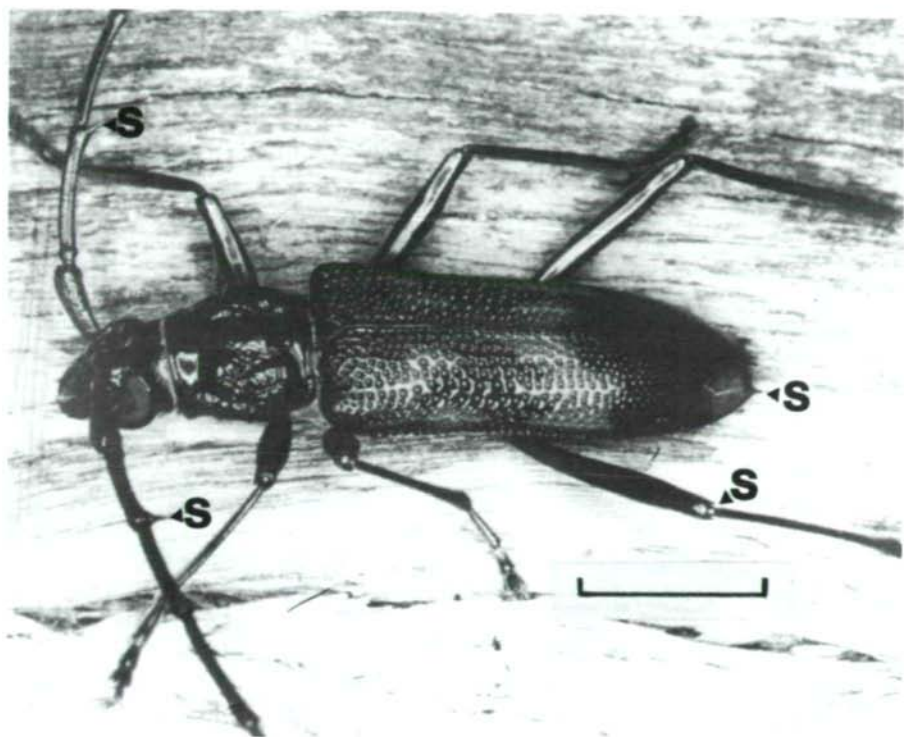


Fig.1: Adult of *Phorocantha synonyma* NEWMAN, 1840, photographed after being attracted to a bright light, Dec. 1983, Griffith University campus, Brisbane, Queensland. Note spine (s) on the antennae, legs (femora) and elytra. - Photograph: T.J. HAWKESWOOD. Scale line = 5 mm.

wards to an exit hole blocked with wood fragments below a minor branch node.

## Biology

The only published notes on the bionomics of *P. synonyma* appear to be those of DUFFY (1963:81-82) who also briefly described the pupa and larva. DUFFY noted that *P. synonyma* attacks living and apparently healthy trees of all sizes and that the duration of the life-cycle is usually 2 years. Attack is often initiated at the side of old branch-nodes or at sides of injury on trees of 10 cm or more in diameter. Each larva chews a single, more or less, circular area under the bark in the sapwood which may measure up to 20 cm in diameter and up to 15 mm deep. The larvae chew away the bark to expose the damaged area in the sapwood. They then bore into the heartwood before reaching maturity and construct 2-4 holes in the heartwood (DUFFY 1963:82). The lowest hole, which is the entrance to the pupal cell, is usually situated about  $\frac{2}{3}$  the distance along the damaged area and after boring horizontally for about 12-25 mm, the larva moves downwards vertically, usually in the heartwood.

K.H.MOORE in DUFFY (1963:82) found that seven separate areas of damage had occurred in a single sapling measuring about 8 metres in height. A.R.BRIMLECOMBE in DUFFY (1963:82) found larvae tunnelling in living saplings of *E. micracantha* (= *E. racemosa*) (no locality data was provided for this record, but we presume that it is Pechey, south-eastern Queensland (as provided in DUFFY's host list, 82-83).

## Discussion

Of the eight reasonably reliable host plant records, 6 belong to the subgenus *Symphyomyrtus* of *Eucalyptus* (viz. *E. crebra*, *E. grandis*, *E. microcorys*, *E. moluccana*, *E. propinqua* and *E. saligna*). The other eucalypt host, *E. citriodora*, belongs to the subgenus *Corymbia*. *Angophora* is closely related to *Eucalyptus*, so much so, that some Australian botanists wish to place this group as a subgenus of *Eucalyptus*. The doubtful hosts of *E. racemosa*

(= *E. micracantha*) and *E. resinifera* belong to the subgenera *Monocalyptus* and *Symphyomyrtus* respectively. Most of the above mentioned *Angophora* and *Eucalyptus* hosts are tall trees restricted to south-eastern Queensland to central and south coastal New South Wales and their distribution conforms well with that of *P. synonyma*. It would therefore appear that *P. synonyma* has a close relationship with these groups of trees and this relationship is most likely to be co-evolutionary (in most cases). Indeed, the group of *E. grandis*, *E. propinqua* and *E. saligna* are very closely related botanically, while *E. microcorys* and *E. resinifera* are sister species and this group is closely related to the group of three *Eucalyptus* species above mentioned. The record of *E. citriodora* as host may indicate that *P. synonyma* has recently shifted to a cultivated species in an urban (non-natural) environment. *E. citriodora* is naturally distributed in central and southern coastal Queensland only (CHIPPENDALE & WOLF 1981:101), and with further research may prove to be a host tree in these areas. The data on host plants is rather limited considering that over 250 species of *Eucalyptus* occur within the presently known range of *P. synonyma*, and it is most likely that further observations will reveal a wider host range.

Almost nothing is known about the biology and behaviour of adults. *Phoracantha* adults mainly rest under bark of their host trees during the day and venture out at night. The adult food plants of *P. synonyma* are unknown. The adults are nocturnal and may be attracted to lights (Fig.1). They, like other members of the Cerambycinae, stridulate when handled and attempt to bite or dig the spines of the prothorax, antennae and legs into the skin if they are handled. Clearly this behaviour is defensive and further observations on predation and mating behaviour should reveal other adaptive uses of the spines on the legs, thorax and elytra (Fig.1) and the general distinctive colour pattern of the adults.

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Druck, Eigentümer, Herausgeber, Verleger und für den Inhalt verantwortlich: Maximilian SCHWARZ, Konsulent für Wissenschaft der O.Ö. Landesregierung, Eibenweg 6, A-4052 Ansfelden.  
Redaktion: Erich DILLER, Münchhausenstr.21, D-8000 München 60.  
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Zeitschrift/Journal: [Entomofauna](#)

Jahr/Year: 1990

Band/Volume: [0011](#)

Autor(en)/Author(s): Hawkeswood Trevor J., Dauber Diethard

Artikel/Article: [Review of the biology and host plants of the Australian longicorn beetle \*Phorocantha synonyma\* NEWMANN, 1840 \(Coleoptera, Cerambycidae\). 125-132](#)